DEPARTMENT OF PRE-UNIVERSITY EDUCATION

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಪದವಿ ಪೂರ್ವ ಶಿಕ್ಷಣ ಇಲಾಖೆ

Department of Pre University Education, Karnataka

CLASS: I PUC

SUBJECT: BIOLOGY (36)

DISCLAIMER

The question bank is prepared for the benefit of students and teachers. The committee worked for the preparation of question bank made all efforts to make comprehensive and foolproof. However, if any mistakes, errors found, please mail at questionbank.pue@gmail.com, academic.pue@gmail.com. There is no guarantee that questions from this question bank only appear in the examination conducted by the department.

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Design of A Question Paper

Class: I PUC

Subject: Biology

Code: 36

Time: 3 Hours 15 Minutes (of which 15 minutes for reading the question paper)

Max. Marks: 70

The weightage of the distribution of marks over different dimensions of the question paper shall be as follows:

A. Weightage to Objectives:

Objective	Weightage %	Marks
Knowledge	40 %	42
Understanding	30 %	33
Application	15 %	15
Skill	15 %	15

Note: 1% or 2% variation is allowed per objective.

B. Weightage to the unit/chapter (Blue print of entire syllabus)

Unit	Chapter No	Chapter name	No of teaching Hours	Marks	Total Marks
I	1	Living World	3	3	17
	2	Biological Classification	2	2	
	3	Plant Kingdom	6	5	
	4	Animal Kingdom	8	7	
II	5	Morphology of Flowering Plants	5	4	15
	6	Anatomy and flowering plants	4	4	
	7	Structural Organization in Animals	8	7	
III	8	Cell – the unit of life	10	8	18
	9	Biomolecules	5	5	
	10	Cell cycle and Cell division	4	5	
IV	11	Transport in Plants	7	6	27
	12	Mineral Nutrition	7	6	
	13	Photosynthesis in Higher Plants	5	5	
	14	Respiration in Plants	5	5	
	15	Plant growth and development	7	5	
V	16	Digestion and Absorption	4	3	28
	17	Breathing and Exchange of gases	4	3	
	18	Body fluids and circulation	5	4	
	19	Excretory products and their elimination	4	3	
	20	Locomotion and movement	5	4	
	21	Neural control and co-ordination	6	5	
	22	Chemical co-ordination and integration	6	6	
Total			120	105	105

Note: Variation of one mark per chapter/unit is allowed. However the total marks should not exceed 105.

C. Weightage to forms of questions

Part	Type of questions	Main	Number of question to be set	Number of question to be answered	Units to be covered
A	1 mark – Very short answer (VSA)		10	10	All Units (05 Units)
B	2 mark – short answer (SA1)		8	5	
C	3 mark – short answer (SA2)		8	5	
D	5 mark – long answer (LA)	Sec -I	05	04	
		Sec – II	05	03	

D. Weightage to level of difficulty:

Level	Weightage %	Marks
Easy	40 %	28
Average	40 %	28
Difficult	20 %	14

General Instructions:

- Questions should be clear, unambiguous understandable and free from grammatical errors.
- Questions which are based on same concepts, law, fact etc. and which generate the same answer should not be repeated under different forms (VSA, SA and LA)

I PUC –BIOLOGY (BLUE PRINT FOR MODEL PAPER 1)

SL.NO	UNIT & CHAPTER	Knowledge				Understanding				Application				Skill				Total				Marks	Total
		1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M		
I	**Diversity in the living world**																						17
1	The living world														**1**				1			2	
2	Biological classification		**1**			**1**												1	1			3	
3	Plant kingdom				**1**																1	5	
4	Animal kingdom								**1**		**1**								1		1	7	
II	**Structural organization in plants and animals**																						15
5	Morphology of flowering plants	**1**							**1**									1			1	6	
6	Anatomy of flowering plants		**1**				**1**												2			4	
7	Structural organization in animals																**1**				1	5	
III	**Cell-Structure and function**																						17
8	Cell: the unit of life				**1**							1								1	1	8	
9	Biomolecules	**1**		**1**														1		1		4	
10	Cell cycle and cell division		**1**													**1**			1	1		5	
IV	**Plant physiology**																						27
11	Transport in plants			**1**		**1**												1		1		4	
12	Mineral nutrition	**2**		**1**														2		1		5	
13	Photosynthesis in higher plants	**1**			**1**													1			1	6	
14	Respiration in plants		1						**1**										1		1	7	
15	Plant growth and development												**1**								1	5	
V	**Human physiology**																						29
16	Digestion and absorption	**1**																1				1	
17	Breathing and exchange of gases								**1**												1	5	
18	Body fluids and circulation		**1**														**1**		1		1	7	
19	Excretory products and their							**1**		**1**								1		1		4	
20	Locomotion and movement	**1**						**1**										1		1		4	
21	Neural control and coordination								**1**												1	5	
22	Chemical coordination and integration			**1**																1		3	
	TOTAL	7	10	12	15	2	2	6	25	1	2	3	5		2	3	10					105	105
		44				35				11				15									
		42%				33%				10%				14%									

Subject Code: 36 (NS)

MODEL QUESTION PAPER 1

I PUC

BIOLOGY

Time: 3 ¼ hours] **[Total No. of questions: 37]** **[Max.Marks: 70**

General Instructions:

i) This question paper consists of four parts – A, B, C and D. Part-D consists of two sections-Section-I& Section-II.

ii) All the parts are compulsory

iii) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks

PART-A

I. Answer the following in **A WORD** or **A SENTENCE** each (10x1=10)

1. What is hydroponics?
2. Why scientific names of organisms are italicized when printed?
3. What is a parthenocarpic fruit?
4. A person's urine sample showed positive result for Glycosuria and Ketonuria. Which disorder does it indicate generally?
5. How does diffusion differ from active transport?
6. Name the most abundant protein in the whole of the biosphere.
7. Which type of leucoplast stores proteins?
8. Name the mineral element that activates the enzyme *Nitrogenase*.
9. Define thecodont.
10. How many bones constitute axial skeleton in adult human body?

PART- B

II. Answer **ANY FIVE** of the following in 3-5 sentences each , wherever applicable (5 x 2 = 10)

11. What is binomial nomenclature? Write the binomial name of Wheat.
12. Draw a neat labeled diagram of a bacteriophage.
13. "All vertebrates are chordates, but all chordates are not vertebrates". Justify the statement.
14. Write any two features of Collenchyma.
15. Differentiate between Heart wood and sap wood.
16. What is crossing over? Name the enzyme responsible for it.
17. What is Glycolysis? Where does it occur in cells?
18. Name the hormones secreted by atrial wall of heart and JGA cells of Kidneys in humans. Mention one function for each hormone.

PART-C

III. Answer **ANY FIVE** of the following in 100-150 words each, wherever applicable (5x3 = 15)

19. Name the cell organelle based on the function given below
    a. Production of cellular energy in the form of ATP
    b. Constitute the basal body of cilia and flagella
    c. Translation of mRNA into polypeptide
20. What are enzymes? Mention any four types of enzymes based on function.
21. Schematically represent different stages of cell cycle.
22. Define the following terms: a) Translocation b) Pressure potential c) Imbibition
23. Enlist the criteria for essentiality of the mineral nutrients in plants.
24. How does haemodialysis help in purifying the blood?
25. Explain the structure of actin filament.
26. Mention the physiological effect in humans due to
    a) Deficiency of Growth hormone
    b) Deficiency of Iodine
    c) Deficiency of Insulin

PART-D

SECTION-I

IV. Answer **ANY FOUR** of the following in 200-250 words each, wherever applicable (4 x5=20)

27. Enumerate any five characteristic features of Gymnosperms.
28. Draw a neat labeled diagram of female reproductive system in Cockroach.
29. Write the functions of
    a) i- Chloroplast ii- Cytoskeleton iii- Nucleolus
    b) Enlist the organelles of endomembrane system
30. Schematically represent Calvin cycle and explain the three reactions that take place during Calvin cycle.
31. Write the physiological effects of Auxins and Gibberellins.
32. Explain how oxygen is transported from lungs to the tissues in human beings.

SECTION-II

V. Answer **ANY THREE** of the following in 200-250 words each, wherever applicable (3 x5= 15)

33. "Birds are well adapted for aerial mode of living". Justify with any five adaptive features in them in support of the given statement.
34. Explain the types of placentation with an example for each.
35. What is anaerobic respiration? Differentiate between Alcoholic fermentation and Lactic acid fermentation.
36. Draw a neat labeled diagram of sectional view of human heart.
37. Explain the pathway of reflex action.

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I PUC –BIOLOGY (BLUE PRINT FOR MODEL PAPER 2)

SL.NO	UNIT & CHAPTER	Knowledge				Understanding				Application				Skill				Total				Marks	Total
		1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M		
I	**Diversity in the living world**																						15
1	The living world																						
2	Biological classification	1																1				1	
3	Plant kingdom			1					1									1		1	1	8	
4	Animal kingdom	1							1												1	6	
II	**Structural organization in plants and animals**																						17
5	Morphology of flowering plants	1																1				1	
6	Anatomy of flowering plants		1														1		1		1	7	
7	Structural organization in animals				1		2												2		1	9	
III	**Cell-Structure and function**																						19
8	Cell: the unit of life						1										1		1		1	7	
9	Biomolecules			1				1												2		6	
10	Cell cycle and cell division	1							1									1			1	6	
IV	**Plant physiology**																						24
11	Transport in plants	1																1				1	
12	Mineral nutrition			1		1												1		1		4	
13	Photosynthesis in higher plants	1			1		1											1	1		1	8	
14	Respiration in plants				1							1								1	1	8	
15	Plant growth and development							1												1		3	
V	**Human physiology**																						30
16	Digestion and absorption								1												1	5	
17	Breathing and exchange of gases							1									1			1	1	8	
18	Body fluids and circulation	1					1											1	1			3	
19	Excretory products and their					1												1				1	
20	Locomotion and movement		1			1												1	1			3	
21	Neural control and coordination										1	1							1	1		5	
22	Chemical coordination and integration				1																1	5	
	TOTAL	7	2	3	4	3	5	3	4		1	2					3						105
		40				42				8				15									
		38%				40%				7%				14%									

Subject Code: 36 (NS)

MODEL QUESTION PAPER 2

I PUC

BIOLOGY

Time: 3 ¼ hours] **[Total No. of questions: 37]** **[Max.Marks: 70**

General Instructions:

i) This question paper consists of four parts – A, B, C and D. Part-D consists of two sections-Section-I& Section-II.

ii) All the parts are compulsory

iii) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks

Part A

Answer the following questions in one word or one sentence each: **(10 x 1 = 10)**

1. Which group of fungi is called Fungi Imperfecti?
2. Give an example of an animal with notochord present only in the larval tail.
3. What is pericarp?
4. What is stroke volume?
5. Expand RUBISCO.
6. What is Quiescent phase of cell cycle?
7. Define Osmosis.
8. Why is leg-haemoglobin referred to as oxygen scavenger?
9. Why is ADH necessary in our body?
10. Muscles are red in colour. Why?

Part B

Answer any five of the following questions in 3 to 5 sentences each **(5 x 2 = 10)**

11. Explain clotting of blood in a human being.
12. Write a note on pivotal and hinge joints in the human skeletal system.
13. State cell theory.
14. Where do you find bulliform cells? What is its significance in plants?
15. Differentiate between Tendons and Ligaments.
16. Mention any two common earthworms of India.
17. Distinguish between PSI and PSII.
18. Differentiate between myelinated and nonmyelinated neuron.

Part C

Answer any five of the following questions in 40 to 80 words each: **(5 x 3 = 15)**

19. Name the three classes of algae with one example for each.
20. Write a note on a) Peptide bond, b) Glycosidic bond , c) Phoshodiester bond.
21. Briefly explain the process of enzyme action.
22. How does nerve impulse get generated and conducted in the human body?

23. Mention the role of (a) *Nitrosomonas* (b) *Nitrobacter* (c) *Pseudomonas*.
24. Calculate the RQ for (a) Carbohydrate (b) Proteins (c) Fats.
25. Explain any three physiological effects of Cytokinins.
26. What is ventilation? Write the differences between Inspiration and Expiration.

Part D - Section I

Answer any four of the following in 200 to 250 words each: (4 x 5 = 20)

27. Differentiate between Chondrichthyes and Osteichthyes, with suitable example.
28. With a neat labelled diagram, explain the structure of plasma membrane.
29. Describe the characters of bryophytes with two suitable examples.
30. Describe the process of protein digestion in human being.
31. Draw a neat labelled diagram of monocot stem.
32. Briefly explain the external morphology of cockroach.

Part D - Section II

Answer any three of the following questions in 200 to 250 words: (3 x 5 = 15)

33. Explain the factors influencing the rate of photosynthesis.
34. Draw a neat labelled diagram of human respiratory system.
35. Mention any five hormones of the adenohypophysis and give one function for each hormone.
36. Explain Prophase I of Meiosis.
37. Schematically represent Krebs cycle.

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I PUC –BIOLOGY (BLUE PRINT FOR MODEL PAPER 3)

SL.NO	UNIT & CHAPTER	Knowledge				Understanding				Application				Skill				Total				Marks	Total
		1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M		
I	**Diversity in the living world**																						
1	The living world	1	1															01	01			03	19
2	Biological classification									1					1			01	01			03	
3	Plant kingdom							1		1								01		01		04	
4	Animal kingdom	1										1	1					01		01	01	09	
II	**Structural organization in plants and animals**																						16
5	Morphology of flowering		1		1														01		01	07	
6	Anatomy of flowering	1																01				01	
7	Structural organization in															1	1			01	01	08	
III	**Cell-Structure and**																						16
8	Cell: the unit of life						1										1	01			01	07	
9	Biomolecules		1									1							01	01		05	
10	Cell cycle and cell division	1						1											01	01		04	
IV	**Plant physiology**																						25
11	Transport in plants	1			1													01			01	06	
12	Mineral nutrition		1		1	1												01	01		01	08	
13	Photosynthesis in higher						1	1											01	01		05	
14	Respiration in plants					1												01				01	
15	Plant growth and								1												01	05	
V	**Human physiology**																						29
16	Digestion and absorption			1																01		03	
17	Breathing and exchange								1												01	05	
18	Body fluids and																1				01	05	
19	Excretory products and				1			1												01	01	08	
20	Locomotion and								1												01	05	
21	Neural control and	1																01				01	
22	Chemical coordination						1												01			02	
	TOTAL	06	08	03	20	02	06	12	15	02		06	05		02	03	15	10	16	24	55		105
		37				35				13				20									
		35%				33%				12%				19%									

Subject Code: 36 (NS)

MODEL QUESTION PAPER 3

I PUC

BIOLOGY

Time: 3 ¼ hours] **[Total No. of questions: 37]** **[Max.Marks: 70**

General Instructions:

i) This question paper consists of four parts – A, B, C and D. Part-D consists of two sections-Section-I& Section-II.

ii) All the parts are compulsory

iii) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks

Part A

Answer the following questions in one word or one sentence each: (10 x 1 = 10)

1. How is consciousness a defining property of living organism?
2. Why lichens are called good pollution indicators?
3. Though Gymnosperms and Angiosperms bear seeds, they are classified separately. Justify.
4. What is meant by metameric segmentation?
5. What is meant by Dedifferentiation?
6. In which stage of prophase I of meiosis does pairing of homologus chromosomes occur?
7. What is Guttation?
8. Name the oxygen scavenger in the root nodules of leguminous plants.
9. What is the physiological junction between axonic end of one neuron and dendritic end of other neuron called?
10. Why does carbonic acid form at a faster rate within RBC's than in plasma during transportation of respiratory gases?

PART-B

Answer any FIVE of the following question in 3-5 sentences each wherever applicable (5x2=10)

11. Draw a labeled diagram of bacteriophage.
12. With reference to taxonomic aids, define a. Key b. Herbarium
13. Write the symbol used in floral formula for the following conditions:
    a. Zygomorphic b. Bisexual c. Five sepals fused d. Hypogynous flower.
14. What are mesosomes in a prokaryotic cell? Write its function.
15. Write the difference between biomacromolecule and biomicromolecule.
16. How does Critical concentration of nutrients differ from toxicity of micronutrients?
17. Light is an important factor that affects photosynthesis. Justify.
18. Define cardiac cycle and cardiac output.

PART-C

Answer any FIVE of the following questions in 100-150 words each: (5x3=15)

19. List any six salient features of Bryophytes
20. a) Which type of coelom is present in Aschelminthes?

b) Which type of symmetry is exhibited by adult Echinodermates?

c) Which type of body wall is present in coelenterates?

21. Draw a labeled diagram of the Nephridial system of the earthworm.
22. List the characteristic events that occur in prophase of mitosis.
23. Write a function of each of the following : a. Insulin b.GLUT-4 c. Antibody
24. Schematically represent Z- scheme of Light reaction.
25. Enzymes play a vital role in digestion. Justify the statement by writing the role of the following enzymes.

    a. Salivary amylase b. Trypsin c.Lipase
26. Write a symptomatic feature of each of the following disorder: a. Gout b. Jaundice c. Asthma.

PART-D

SECTION -I

Answer any FOUR of the following questions in 200-250 words wherever applicable. (4x5=20)

27. Write six salient features of phylum Arthropoda.
28. Draw a neat labeled diagram of the digestive system of Cockroach.
29. Explain the mass flow hypothesis of transport in phloem.
30. Explain the Nitrogen cycle with a schematic representation.
31. Name the type of joint present between in a. Humerus and pectoral girdle b. Condyles of skull and atlas vertebra c. between carpals of wrist and metacarpals of hand. d. between the carpals. e. Joints in skull.
32. Explain the mechanism of breathing in human beings.

SECTION – II

Answer any THREE of the following questions in 200-250 words each wherever applicable. (3x5=15)

33. What is an aestivation? Explain the different types of aestivation.
34. Draw a neat labeled diagram of the plant cell.
35. Write a note on discovery, physiological functions, agricultural and horticultural applications of abscisic acid.
36. What is Glomerular filtrate? Write the functions of PCT and DCT in urine formation.
37. Draw a neat labeled diagram of the V.S of human heart.

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UNIT 1: DIVERSITY IN THE LIVING WORLD
CHAPTER 1: LIVING WORLD

ONE MARK QUESTIONS

1. What is reproduction?(k)
2. What is metabolism?(K)
3. Define biodiversity.(K)
4. Name the basic unit of classification.(K)
5. Define species.(K)
6. What is taxonomic hierarchy?(K)
7. What is a taxon?(K)
8. What is classification?(K)
9. Who introduced Binomial nomenclature?(K)
10. Define nomenclature.(K)
11. Define taxonomy.(K)
12. What is flora?(K)
13. What is the use of manuals?(K)
14. What are monographs?(K)
15. Name an animal that shows true regeneration.(K)
16. What is the title of publication of Linnaeus?(U)
17. What is family with reference to taxonomic categories? (K)
18. What is taxonomic hierarchy?(K)
19. Which organism reproduces by fragmentation?(U)
20. Growth is synonymous with reproduction in unicellular organisms. Why? (U)
21. What is self consciousness?(K)
22. What are living organisms? (K)
23. What is identification with reference to taxonomy?(K)
24. What is systematics? (K)
25. What is a species?(K)
26. What is a genus?(K)
27. Write the biological (scientific) name of Man.(K)
28. Write the biological (scientific) name of Housefly.(K)
29. Write the biological (scientific) name of Wheat.(K)
30. Write the biological (scientific) name of Mango.(K)
31. What is a Lead with reference to taxonomical aids?(K)
32. What is a Couplet?(K)
33. What are taxonomic al aids?(K)
34. Define Herbarium(K)
35. Expand the abbreviation ICBN. (K)
36. Expand the abbreviation ICZN. (K)
37. Name the family to which Wheat belongs? (K)
38. Name the family to which Mango belongs? (K)
39. Name the family to which Housefly belongs? (K)
40. Name the family to which Man belongs? (K)

TWO MARKS QUESTIONS

41. What are the twin characters of growth.(K)
42. What is Binomial nomenclature? Give an example for a binomial name.(K)
43. Why are the classification systems changing every now and then?(U)
44. What are the methods used to record description of organisms?(K)
45. How is key helpful in identification and classification of an organism?(A)
46. Write the taxonomic 'order' of the following . a) Mango b) Wheat (K)
47. Write the taxonomic 'order' of the following . a) Housefly b) Man (K)
48. What are the other means of taxonomical aids that help in recording descriptions? (K)
49. What are essential features of organisms that form the basis of modern taxonomic studies? (K)
50. Write the significance of herbarium? (U)

THREE MARKS QUESTIONS

51. Why are the living organisms are classified?(U)
52. What is binomial nomenclature? Write the universal rules of binomial nomenclature. (K)
53. Name three famous botanical gardens.(K)
54. Write the taxonomic categories of Man.(K)
55. Write the taxonomic categories of Housefly.(K)
56. Write the taxonomic categories of Mango.(K)
57. Write the taxonomic categories of Wheat.(K)
58. Write a note on 'Key' as a Taxonomic aid.(K)

FIVE MARKS QUESTIONS.

59. Write a brief note on taxonomic categories.(K)
60. Write a note on taxonomical aids.(U)
61. "Metabolism and consciousness become defining property of living organisms". Justify with reasons (U)
62. "Reproduction is not a defining property of growth". Justify with reasons.(U)
63. "Growth is a non defining property of life". Give reasons.(U)

CHAPTER 2: BIOLOGICAL CLASSIFICATION

ONE MARK QUESTIONS

1. Who proposed five kingdom system of classification? (K)
2. Name the kingdom which includes unicellular organisms with eukaryotic organization. (K)
3. Which type of bacteria is present in the gut of some ruminant animals? (K)
4. What is the role of heterocysts in *Nostoc*?(U)
5. Which are the smallest living cells without cell wall and which can survive without oxygen? (K)
6. Which organisms are called saprophytic protists?(K)
7. Why do we keep the food in refrigerators? (A)
9. Where do coprophilous fungi grow? (K)
10. What are morels and truffles (buffles)? (K)
11. Plants are usually autotrophic, but some are exceptional and parasitic. Name a parasitic plant. (K)
12. Why is deuteromycetes called fungi imperfecti? (U)
13. What is 'Diatomaceous earth'? (K)
14." Lichens are good pollution indicators". Justify. (A)
15. What are capsomeres? (K)
16. What are red tides? (K)
17. Name the organism which causes red tides. (K)
18. Which group of organisms has two flagella? (K)
19. Why are the cell walls of chrysophyta indestructible? (U)
20. Name the parasite which causes sleeping sickness. (K)
21. Which fungus is extensively used in biochemical and genetic work? (A)
22. What is plasmogamy? (K)
23. What is karyogamy? (K)
24. What are fruting bodies? (K)
25. Define dikaryon. (K)
26. Who discovered viroids? (K)
27. What are archaebacteria? (K)
28. What is mycelium? (K)
29. Give an example for unicellular fungus. (K)
30. Which is the most notorious parasite of Man?(K)

TWO MARKS QUESTIONS:

31. Which are the four major groups of Protozoans? (K)
32. List out the four classes of kingdom Fungi.(K)
33. Name the fruiting bodies of i] Ascomycetes ii] Basidiomycetes.(K)
34. List any four role of fungi in our daily life.(A)
35. Write any two differences between Viruses and Viroids.(A)

36.Write the algal and fungal components of lichens.(K)
37.State any two economical importances of heterotrophic bacteria. (A)
38.What do the terms algal blooms and red tides signify?(U)
39.Suppose you find an old preserved slide without label , in your effort to identify you place it under the microscope and observe the following features-a) Unicellular, b) Well defined nucleus c) Biflagellate with one flagellum longitudinally and the other transversely. What do you identify it as? Can you name the kingdom to which it belongs? (A)
40. Classify the bacteria based on their shape with a diagram (U)
41.What do the following terms mean?
a) Coenocytic hyphae b) Dikaryophase (K)
42. Name the a. asexual motile spores of Phycomycetes
b. asexual spores in Ascomycetes. (K)
43. Mention any two living and nonliving characters of viruses. (K)
44. Classify the viruses with respect to the nature of genetic material. (U)
45. What are the characteristic features of Euglenoids? (K)
46. List four diseases caused by viruses in animals. (K)
47. Differentiate between phycobiont and mycobiont. (U)
48. Draw a neat labeled diagram of TMV. (S)
49. Differentiate between chemosynthetic and photosynthetic forms of eubacteria. (U)
50. List the uses of heterotrophic bacteria. (U)
51. Give two examples of fungal symbiotic associations. (K)

THREE MARKS QUESTIONS:

52.Draw a labeled diagram of a bacteriophage.(S)
53.Write briefly about the steps involved in sexual cycle of kingdom fungi.(K)
54.Give a comparative account of the kingdoms Monera and Protista with respect to cell type, cell wall, body organization.(A)
55.Cyanobacteria and heterotrophic bacteria though vastly different have been clubbed together in eubacteria of kingdom- Monera according to five kingdom classification. Is the grouping of the two types of taxa in the same kingdom justified? (A)
56.Draw a labeled diagram of *Nostoc* filament. (S)
57.List six symptoms of viral diseases in plants. (k)
58.Write three uses of diatomaceous earth. (K)
59.Write a note on three types of Archaebacteria.(K)

FIVE MARKS QUESTIONS:

60.Explain the modes of Nutrition in Bacteria.(U)
61.Name a disease caused by each of the following-
a. *Puccinia* b. *Plasmodium*. c. Viroids .d. Viruses e. *Ustilago*. (K)
62.What are the three types of reproduction in Bacteria? Draw a labeled sketch of a dividing bacterium. (K)
63.Explain the salient features of kingdom Monera.(K)
64.Write a note on Eubacteria.(U)
65.What is the basis of classification in fungi? Explain four classes of fungi. (K)
66.Explain five classes of kingdom Protista. (U)
67.Write the salient features of kingdom Protista. (K)

CHAPTER 3: PLANT KINGDOM

ONE MARK QUESTIONS:

1. Why it is not acceptable to consider vegetative characters for plant classification? (K)
2. Which system of classification assumed that organisms belonging to the same taxa have a common ancestor? (K)
3. What is cytotaxonomy? (K)
4. What is chemotaxonomy? (K)
5. What is numerical taxonomy? (K)
6. What are algae? (K)
7. What are kelps? (K)
8. What is the basis of classification of algae? (K)
9. Give an example for filamentous alga. (K)
10. Give an example for unicellular alga? (K)
11. Give an example for colonial alga? (K)
12. How do algae reproduce vegetatively? (K)
13. Name the most common asexual reproductive structure in algae. (K)
14. What are zoospores? (K)
15. Name an algal genus that shows both Isogamous and Anisogamous condition. (K)
16. Why *Chlorella* and *Spirullina* are used by space travelers? (K)
17. What are pyrenoids? (K)
18. Which class of algae is known as brown algae? (K)
19. Give an example for brown algae. (K)
20. How are brown algae attached to the substratum? (K)
21. What is the name given to leaf like photosynthetic organ in the plant body of Phaeophyceae? (K)
22. Name the substance that covers the cell wall of vegetative cells in brown algae. (K)
23. Which class of algae produces biflagellated pear shaped zoospores? (K)
24. What do you mean by pyriform gametes? (K)
25. Name the predominant pigment in red algae. (K)
26. Which class of algae is known as red algae? (K)
27. Name the type of food substance that is stored in red algae. (K)
28. In which group of algae, both spores and gametes are non-motile? (K)
29. Which group of algae shows only Oogamous type of sexual reproduction? (K)
30. Give an example for red algae. (K)
31. Which product of algae is used in the preparation of ice-creams and jellies? (K)
32. Why bryophytes are called Amphibians of plant kingdom? (K)
33. Which is the dominant phase in the life cycle of bryophytes? (K)
34. What is the ploidy of thallus in bryophytes? (K)
35. Why gametophyte is called so? (K)
36. Name the first stage of gametophyte development in mosses. (K)
37. Name the male sex organ in bryophytes. (K)
38. Name the female sex organ in bryophytes. (K)
39. Name the moss that provides peat. (K)
40. What are gemmae? (K)
41. In the sporophyte of mosses where does meiosis take place? (K)
42. How do mosses help in colonization of higher plants? (K)
43. Which are the first terrestrial plants to possess vascular tissues? (K)

44. What is the evolutionary significance of pteridophytes? (K)
45. Which is the dominant phase in the life cycle of pteridophytes? (K)
46. What are sporophylls? (K)
47. Name the male sex organ in pteridophytes. (K)
48. Name the female sex organ in pteridophytes. (K)
49. What is prothallus? (K)
50. Which type of cell division precedes formation of spores in plants? (K)
51. Why are pteridophytes restricted to narrow geographical regions? (K)
52. What is homosporous condition? (K)
53. What is heterosporous condition? (K)
54. Give an example for heterosporous pteridophyte. (K)
55. Which group of plants showed an event which is known to be a precursor to seed habit in plant kingdom? (K)
56. Why are gymnosperms called as naked seeded plants? (K)
57. What are coralloid roots? (K)
58. What is the significance of coralloid roots in Cycas? (K)
59. Which organism is associated with roots of Cycas to form coralloid roots? (K)
60. Name the gymnosperm that shows mycorrhiza. (K)
61. Name one of the tallest tree species among gymnosperms. (K)
62. How many megaspores remain functional in each ovule of the spermatophytes? (K)
63. Which is the smallest angiosperm?
64. Why the cells of embryo sac in angiosperms are haploid? (K)
65. Give an example for microscopic flowering plant. (K)
66. What is an embryo sac in angiosperms? (K)
67. How is secondary nucleus of the embryo sac formed? (K)
68. What is syngamy? (K)
69. What does PEN in angiosperms would develop into? (K)
70. What is the pattern of life cycle shown by seed bearing plants? (K)
71. Which group of plants exhibit haplo-diplontic life cycle? (K)
72. Mention an alga that exhibits haplo-diplontic life cycle. (K)
73. Which alga shows diplontic life cycle? (K)
74. Which cell represents the beginning of sporophytic stage of plants' life cycle? (K)
75. Both gymnosperms and angiosperms bear seeds, then why are they classified separately? (K)
76. Mention the ploidy of the following (K)
    a. Protonemal cell of a moss
    b. Primary endosperm nucleus in dicot
    c. Leaf cell of a moss
    d. Prothallus cell of a fern
    e. Gemma cell in *Marchantia*
    f. Meristem cell of monocot
    g. Ovum of a liverwort
    h. Zygote of a fern
77. Which is the male sex organ in flower? (K)
78. What is the function of endosperm in seeds? (K)
79. Name the only diploid structure in plants showing haplontic life cycle. (K)
80. Which pattern of life cycle is shown by seed bearing plants? (K)

TWO MARK QUESTIONS:

81. What were the basis/criteria for classification in Linnaeus's system? (K)
82. What were the drawbacks of artificial system of plant classification? (K)
83. Define a) Cytotaxonomy, b) Chemotaxonomy (K)
84. Give any two examples of organisms with which algae are found associated. (K)
85. List out the important pigments found in brown algae. (K)
86. List any four characters of rhodophyceae. (K)
87. Name any two commercially used hydrocolloids isolated from algae. (K)
88. Differentiate between Isogamous and Anisogamous condition. (U)
89. Write any two economic importances of bryophytes. (K)
90. What are the two stages in the gametophytic phase of mosses? (K)
91. Mention the four classes of pteridophytes. (K)
92. Differentiate between thallus of bryophytes and prothallus of pteridophytes. (U)
93. How are leaves in gymnosperms adapted to withstand extremes of climatic factors? (K)
94. What are male gametophytes in gymnosperms called as? Where do they develop? (K)
95. Explain the heterosporous nature of gymnosperms. (U)
96. Which are the two classes of angiosperms? (K)
97. What do the following structures of angiosperms would develop into? (K)
    a. Zygote
    b. PEN
98. What is diplontic life cycle? Give an example. (K)
99. Explain briefly Protonema with suitable example showing it. (U)
100. Explain briefly Diplontic with suitable example showing it. (U)
101. Explain briefly Sporophyll with suitable example showing it. (U)
102. Explain briefly Isogamy with suitable example showing it. (U)
103. Differentiate between Red algae and brown algae (U)
104. Differentiate between Green algae and Red algae (U)
105. Differentiate between Liverworts and moss (U)
106. Differentiate between Homosporous and heterosporous pteridophyte (U)
107. Differentiate between Syngamy and triple fusion. (U)
108. What is haplo-diplontic life cycle? Name any two algae that follow such pattern of life cycle. (K)
109. Name the cells of the embryo sac that degenerate after fertilization. (K)
110. Briefly describe the structure of female strobilus in gymnosperms. (U)

THREE MARK QUESTIONS:

111. Mention the three classification system of angiosperms. (K)
112. Write a note on reproduction in algae. (K)
113. How are algae classified based on the fusion of gametes? (U)
114. Write a note on different classes of algae with reference to their flagellar number and position of insertions. (U)
115. Write any six important characteristics of Chlorophyceae. (K)
116. What are the characteristic features of brown algae? (K)
117. Write the important cell wall chemical and food storage substance in the following groups of algae. (K)
118. "Mosses are ecologically important group of plants". Justify. (U)
119. Write a note on alternation of generation in bryophytes. (U)
120. Draw a neat labeled diagram showing different parts of a moss plant *Funaria*. (S)

121. How does sexual reproduction take place in pteridophytes? (U)
122. What is an embryo sac in angiosperms? List out the different cells of the embryo sac. (K)
123. What is double fertilization? Define two events in it. (K)
124. Mention the different life cycle patterns in plants. (K)
125. Both bryophytes and pteridophytes exhibit haplo-diplontic life cycle, yet they differ. Justify.(U)
126. What is heterospory? Briefly comment on its significance. Give two examples. (K)

FIVE MARK QUESTIONS:

127. "Algae are useful to man in a variety of ways". Justify the statement with suitable examples.(U)
128. Describe the salient features of algae. (U)
129. Differentiate between Chlorophyceae and Rhodophyceae.(U)
130. Enumerate the important events in the life cycle of bryophytes. (K)
131. Describe the salient features of pteridophytes. (U)
132. Write an account of sporophytic generation in pteridophytes.(U)
133. Explain the life cycle of gymnosperms.(U)
134. List out the post-fertilization changes in angiosperms. (K)
135. What is alternation of generations? Name the two generations in plants' life cycle. Schematically represent different life cycle patterns in plants.(S)
136. When and where does reduction division take place in the life cycle of a liverwort, a moss, a fern, a gymnosperm and an angiosperm?(K)
137. Name the three groups of plants that bear archegonia.Briefly describe life cycle of any one of them (K)
138. Write a note on economic importance of algae (U)
139. Describe the important characteristics/salient features of gymnosperms.(U)
140. Summarize the life cycle of an angiosperm.(U)
141. Schematically represent the life cycle of angiosperms. (S)
142. Describe the salient features of angiosperms. (U)
143. Describe the salient features of Bryophytes (U)
144. Describe the salient features of Pteridophytes (U)
145. Describe the salient features of Algae(U)

CHAPTER 4: ANIMAL KINGDOM

ONE MARK QUESTIONS:

1. How does classification help the newly described species? (A)
2. What is meant by cellular grade of organization? (U)
3. What is meant by tissue grade of organization? (U)
4. What is meant by organ grade of organization? (U)
5. Why are the sponges mostly asymmetrical? (U)
6. What is a coelom? (K)
7. What are choanocytes? (K)
8. What is meant by hermaphrodites? (U)
9. What is meant by internal fertilization? (U)
10. 'Some coelenterates are sessile'. What does sessile mean? (A)
11. Name the stinging capsule present in cnidoblasts. (K)
12. 'Cnidarians have tissue grade of organization'. Justify. (A)
13. What is the composition of skeleton in corals? (K)
14. What is the function of comb plates? (K)
15. What are ctenophores commonly known as? (K)
16 . Why are ctenophores commonly called comb jellies? (U)
17. 'Bioluminiscence is well marked in Ctenophores' . What is meant by bioluminescence? (U)
18. 'Platyhelminthes are called Flat worms'. Justify.(A)
19. Name the only phylum in which the animals are diploblastic and radially symmetrical. (K).
20. What is the 'power of regeneration' with respect to some animals? (U)
21. Name the specialized cells in platyhelminthes which help in osmoregulation and excretion. (K)
22. Why are aschelminthes called round worms? (A)
23 . Name the phylum that includes triploblastic, pseudocoelomate animals. (K)
24. What is meant by a complete digestive system? (U)
25.'Development is indirect'. How do you interpret?(U)
26. What are dioecious animals? (K)
27. What are metameres? (K)
28. Name the phylum among non-chordates that bears closed vascular system.(A)
29.. Which is the largest phylum in kingdom animalia? (K)
30. Why are arthropods called so? (U)
31. What is the function of Statocyst? (K)
32. Which is the excretory organ in arthropods? (K)
33. Which is the second largest phylum in kingdom animalia? (A)
34. What is a radula? (K)
35. Which phylum has most distinctive water vascular system? (K)
36. Which of the protochordates have notochord in the tail?(K)
37. Which class of vertebrates has jawless circular mouth? (K)
38. "Cartilaginous fishes should swim constantly to avoid sinking unlike bony fishes". Why? (U)
39. What is a cloaca? (K)
40. What are pneumatic bones? (U)
41. Aves and mammals are homoiothermous. Justify. (A)
42. Where are the oil glands in birds located? (U)
43. Name the milk producing glands of mammals. (K)

44. What are the external ears of mammals called? (K)
45. What does the skin of mammals (exoskeleton) posses? (K)
46. What is meant by incomplete digestive system? (K)
47. What is metamerism? (K)
48. Name the excretory organs in Annelids? (K)
49. Which organism is called living fossil? (K)
50. What are poikilothermous organisms? (U)
51. Which organ represents the ear in Amphibians? (U)
52. Which reptile has four chambered heart? (K)
53. What is the exoskeleton of Arthropods made of? (K)
54. What is pinna? (U)

TWO MARKS QUESTIONS.

1. Write the difference between open and closed type of circulatory system. (U)
2. What is radial symmetry? Give an example. (K)
3. What is bilateral symmetry? Give an example. (K)
4. Differentiate between diploblastic and triploblastic body wall. (U)
5. Write the difference between mesogloea and mesoderm. (U)
6. What is the difference between spongocoel and coelenteron? (U)
7. Mention the adaptations in Platyhelminthes for their successful parasitic living.(U)
8. In coelenterates, digestion is both extracellular and intracellular. Justify. (A)
9. Write the scientific name of the following-a. Tape worm, b. Round worm. (K)
10. Write the common name of the following- a. *Fasciola* b. *Physalia*. (K)
11. Give an example for a gregarious pest and vector among arthropods. (K)
12. Assign the following to their respective phyla-
    a. Balanoglossus b. Petromyzon c. Octopus d. Adamsia. (A)
13. List any four salient features of phylum chordata (K)
14. Write one function of each of the following-
    a. Parapodia b. Nephridia c. Mantle d. Cnidoblasts (K)
15. Differentiate oviparity from viviparity. (U)
16. Differentiate between coelomates and acoelomates with an example each. (U)
17. Differentiate between urochordates and cephalochordates. (U)
18. Name the skeletal structures of sponges? (K)
19. Diagrammatically represent the characters of Chordates. (S)

THREE MARKS QUESTIONS

1. Mention the fundamental features that form the basis for classifying animals. (K)
2. Define the following a. Metagenesis b. Metamerism 3. Metamorphosis (K)
3. List any three differences between Chondrichthyes and Osteichthyes. (U)
4. Write one example each of the following - a. Cold blooded animal
   b. Warm blooded animal c. Animal possessing dry and cornified skin(K)
5. Write the appropriate terms to the following –
   a. Blood filled in arthropods b. Free swimming body form of Cnidaria,
   c. Lateral appendages in aquatic annelids (U)
6. There has been an increase in the number of chambers in heart during the evolution of vertebrates. Give the names of the classes of vertebrates having two, three, and four chambered

heart. (A)
7. Name the excretory organs of the following- a. Cockroach b. Balanoglossus c.Leech (K)
8. The germ layers and body cavity are correlated. Keeping this in view, define the following-
a. Acoelom b.Pseudocoelom c. Eucoelom (U)
9. Write any three salient features of class Cyclostomata.(K)
10." Reptiles are the pioneer animals truly adapted for terrestrial mode of living". Justify the statement with three terrestrial adaptations of reptiles (A).
11. Write the scientific names of the following-
a. Peacock b. Tiger c. Blue whale (A)
12. Hemichordata was earlier placed under phylum chordata, but now it is grouped under non -chordata. List any three features that support the change in grouping. (A)
13. Arthropods are adapted for various habitat. List any three different respiratory organs that facilitate them to respire.(K)
14. Mention three subphyla of phylum Chordata with an example each.(K)
15. Enlist three important features of phylum Ctenophora.(K)
16. Enumerate the salient features of Aschelminthes.(U)
17. Enumerate the salient features of Platyhelminthes.(U)
18. Enumerate the salient features of Mollusca.(U)
19. What are the fundamental characters of Phylum Chordata? (K)

FIVE MARKS QUESTIONS:

1. Write the general characters of phylum Porifera (K).
2. List the general features of phylum Annelida.(K)
3. Write the salient features of phylum Arthropoda(K)
4. How are Echinoderms unique with regard to their symmetry? Enlist the other features of the phylum.(A)
5. Tabulate a comparative study between Non chordates and chordates.(U)
6. How do cartilaginous fishes differ from bony fishes?(K)
7. Mammals are most adapted and most evolved among all the animals. Elaborate with five important features. (U)
8. Write the adaptive characters in birds that support their aerial mode of living (U)
9. Write one function for each of the following- a. Tympanum b.Nictitating membrane c. Water vascular system d. Air bladder e. Comb plates. (A)
10. Write the common name of the following-
a. Spongilla b. Pennatula c. Wuchereria d. Hirudinaria e. Limulus.(K)
11. Write the scientific names of the following-
a. Devil fish b. Hag fish c. Dog fish d. Flying fish e. Saw fish. (K)
12. Enumerate the salient features of phylum Porifera.(U)
13. Enumerate the salient features of phylum Coelenterata. (U)

UNIT 2: STRUCTURAL ORGANIZATION IN PLANTS AND ANIMALS

CHAPTER 5: MORPHOLOGY OF FLOWERING PLANTS

ONE MARK QUESTIONS:

1. Define morphology.(K)
2. What is tap root system?(K)
3. What is fibrous root system?(K)
4. What are adventitious roots?(K)
5. Define venation.(K)
6. Define inflorescence.(K)
7. What is a flower?(K)
8. Define aestivation in angiosperms.(K)
9. Define placentation.(K)
10. What is a fruit?(K)
11. What is primary root?(K)
12. Mention the function of root hairs. (K)
13. In which group of plants primary root is short lived and replaced by large number of roots.(U)
14. In which region of the root cells are small, thin walled with dense protoplasm.(U)
15. What is a node?(K)
16. What are internodes?(K)
17. What are stem tendrils? (K)
18. Mention the function of tendrils.(A)
19. Pneumatophores are found only in swampy areas. Why? (U)
20. Give an example of the stem which performs photosynthesis.(A)
21. Define leaf. (K)
22. What do you call a swollen leaf base? (U)
23. What is phyllotaxy? (k)
24. Which part of the plant gets modified in Venus fly trap? (K)
25. Name the plant from which Colchicine is extracted. (S)
26. What is simple leaf? (K)
27. What is compound leaf?(K)
28. Define lamina or leaf blade.(K)
29. Which type of phyllotaxy is present in *Calotropis*? (U)
30. In Australian acacia which part is modified for synthesis of food.(U)
31. Define hypogynous flower.(K)
32. Define epigynous flower.(K)
33. Define perigynous flower.(K)
34. What is a staminode?(K)
35. Name the condition when stamens are attached to the petals.(U)
36. Which type of phyllotaxy is present in *Alstonia*?(U)
37. Define gamopetalous.(K)
38. Define polypetalous. (K)

39. Give an example for epiphyllous flower. (K)
40. What is parthenocarpic fruit?(K)
41. What is Coleoptile? (K)
42. Define Coleorhizae. (K)
43. What is apocarpous condition? (K)
44. What is syncarpous condition? (K)
45. Define bracteate.(K)
46. Define ebracteate.(K)
47. What leads to formation of primary root?(U)
48. Which region of root produces root hairs? (k)
49. Give an example for modified adventitious root which stores food.(U)
50. What are pneumatophores? (K)
51. Name the plant which produces pneumatophores. (K)
52. Define actinomorphic condition.(K)
53. Name the family which has perianth as floral whorl.(K)
54. Which is the potato family?(K)
55. Name the thimble like structure which covers root apex.(K)
56. Which is the most important vegetative organ for photosynthesis?(K)
57. Define zygomorphic flower.(K)
58. Define epiphyllous. (K)
59. Define valvate aestvation. (K)
60. Define imbricate aestivation.(K)
61. Define twisted aestivation. (K)
62. Define vexillary aestivation.(K)
63. What is aleurone layer?(K)
64. What do you call the cotyledon of a monocot seed? (K)
65. Name the layer which separates endosperm and embryo in monocots.(K)

TWO MARKS QUESTIONS:

66. What is modification of root? Give an example of prop roots and stilt roots. (K)
67. Mention the characteristic features of stem.(K)
68. Draw a neat labeled showing parts of a leaf.(S)
69. Write any four functions of stem. (K)
70. Mention the functions of veins in leaves. (K)
71. Differentiate a simple leaf from compound leaf. (U)
72. List the economically important plants of family Solanaceae (K)
73. List the economically important plants of family Fabaceae(K)
74. List the economically important plants of family Lilliaceae(K)
75. Differentiate between pinnately compound leaf and palmately compound leaf. (U)
76. Differentiate between apocarpous and syncarpous ovary.(U)
77. Differentiate between epipetalous and epiphyllous condition. (U)
78. Mention two major types of inflorescence.(K)
79. Name the accessory organs of the flower.(K)
80. Differentiate between gamosepalous and polysepalous.(U)
81. Differentiate between polyandrous and adelphy.(U)
82. Name the two layers of seed coat.(K)
83. Sketch and label a dicotyledonous seed.(S)

84. Mention the four types of aestivation in plants.(K)
85. Define valvate aestivation. Give an example. (A)
86. Define imbricate aestivation. Give an example. (A)
87. Define twisted aestivation. Give an example. (A)
88. Define vexillary aestivation. Give an example. (A)

THREE MARKS QUESTIONS:

89. Define- a) Trimerous b) Bracteate c) epipetalous (K)
90. Define- a)Monadelphous b) Diadelphous c)Polyadelphous (K)
91. Mention the regions of root tip. (A)
92. Write the floral characters of family Fabaceae.
93. Write the floral characters of family Solanaceae.
94. Write the floral characters of family Liliaceae.
95. Name the family to which the following plants belong to a) *Sesbania* b) *Belladona* c)*Asparagus* (K)
96. Explain the structure of a drupe. (U)
97. Name the three wall layers of a fruit. (K)
98. What is venation? Mention the types of venation.(K)
99. Explain three different types of phyllotaxy. (U)
100. How do various leaf modifications help plants?(U)
101. Describe the arrangement of floral members in relation to their insertion on thalamus. (U)
102. Mention any three modifications of stem with example. (A)
103. Write a note on symmetry of flower. (U)
104. Draw a floral diagram of family Fabaceae.(S)
105. Draw a floral diagram of family Solanaceae.(S)
106. Draw a floral diagram of family Liliaceae.(S)

FIVE MARKS QUESTIONS:

107. With the help of labelled diagram explain the different regions of root tip. (S)
108. Explain the structure of a dicotyledonous seed. (U)
109. Draw a neat labelled diagram to show different parts of a flowering plant.(S)
110. Write a note on modifications of stem.(U)
111. With the help of labelled diagram explain structure of leaf. (S)
112. Explain the different types of aestivation with relevant diagrams. Mention one example for each type.(U)
113. Write the semi technical description of a typical flowering plant.(S)
114. Describe various types of placentation found in flowering plants with suitable diagrams. (U)
115. What is a flower? Describe the four whorls of a flower. (U)
116. With the help of labelled diagram explain monocotyledonous seed.(S)
117. Write any five salient features of family Fabaceae . (K)
118. Write any five salient features of family Solanaceae . (K)
119. Write any five salient features of family Liliaceae. (K)

CHAPTER 6: ANATOMY OF FLOWERING PLANTS

ONE MARK QUESTIONS:

1. Define tissues. (K)
2. What are meristems? (K)
3. How are axillary buds formed? (K)
4. Which meristem regenerates the parts removed by the grazing herbivores in grasses? (K)
5. What do you call the meristem that occurs between mature tissues? (K)
6. What are primary meristems? (K)
7. Name the secondary meristem that produces woody axis. (K)
8. Why lateral meristem is considered as secondary meristem? (K)
9. Which meristem produces different tissue systems in primary plant body? (K)
10. What are permanent cells? (K)
11. Which simple tissue forms the major component within the plant organs? (K)
12. Which tissue shows angular wall thickening of its cells? (K)
13. Name the chemical component in the cell wall of sclerenchyma. (K)
14. Sclerenchyma cells are more rigid than collenchyma cells. Why? (U)
15. What are sclereids? (K)
16. What are fibres? (K)
17. Name the tissue that conducts water and minerals in plants. (K)
18. What are complex tissues? (K)
19. Why are xylem and phloem called complex tissues? (K)
20. Which component of the phloem is lacking in gymnosperms? (K)
21. What is the function of xylem parenchyma? (K)
22. How does radial conduction of water take place in plants? (K)
23. Xylem vessels towards the pith are broader in roots and narrow in stems. Why? (U)
24. Name the enucleated living cell of higher plants. (K)
25. A piece of wood showed no vessels when examined. Which division of plants does it belong to? (A)
26. Name the food conducting tissue in plants. (K)
27. Which component of the phloem lacks a nucleus? (K)
28. Which cells are present in the phloem of gymnosperms instead of companion cells? (K)
29. What are sieve plates? (K)
30. Which cells of the phloem have obliterated central lumens? (K)
31. How are sieve tubes and companion cells connected in phloem? (K)
32. Which cells control the functioning of sieve tubes? (K)
33. Which component of the phloem is absent in most of the monocots? (K)
34. Which component of the phloem dies at maturity? (K)
35. Which part of the dicot stem is also called starch sheath? (K)
36. Which component is lacking in primary phloem? (K)
37. Name the outermost layer of the primary plant body. (K)
38. Which type of tissue constitutes the epidermis of plant organs? (K)
39. What is the function of cuticle? (K)
40. Name the plant organ which lacks cuticle. (K)
41. How are subsidiary cells around stomata formed? (K)
42. What is stomatal apparatus? (K)

43. Which cells of the stomata regulate their opening and closing? (K)
44. What is mesophyll? (K)
45. Why dicot leaves are also called as dorsiventral leaf? (K)
46. Monocot leaf is an isobilateral leaf. Why? (K)
47. What is the shape of guard cells in grasses? (K)
48. What are vascular bundles? (K)
49. What are open vascular bundles? (K)
50. What are closed vascular bundles? (K)
51. What are radial vascular bundles? (K)
52. What are conjoint vascular bundles? (K)
53. What are casparian strips? (K)
54. What are root hairs? (K)
55. Which layer gives rise to lateral roots? (K)
56. What is the function of root hairs? (K)
57. What is the significance of trichomes in plants? (K)
58. Root epiblema is not covered by cuticle. Why? (A)
59. What is conjuctive tissue? (K)
60. What is stele? (K)
61. Which type of cells constitutes hypodermis in monocot stem? (K)
62. Which is the innermost layer of cortex in roots? (K)
63. What are trichomes? (K)
64. What is the epidermal cell modification in plants which prevents water loss? (K)
65. What are the cells that make the leaves curl in plants during water stress? (K)
66. What are the bundle sheath extensions in monocot leaf made of? (K)
67. What is primary growth in plants? (K)
68. What is secondary growth? (K)
69. Monocot stems do not form wood. Why? (U)
70. Monocots do not form secondary tissues. Why? (U)
71. What is vascular cambium? (K)
72. During secondary growth in dicot stem, the amount of secondary xylem produced is more than secondary phloem. Why? (K)
73. What are annual rings? (K)
74. What are lenticels? (K)
75. What is the function of lenticels? (K)
76. How is the age of a tree estimated? (K)
77. Why is heartwood resistant to attack of microbes and insects? (K)
78. Name the region of dicot stem where cork cambium develops. (K)
79. Why is cork impervious to water? (K)
80. What is periderm? (K)
81. The transverse section of a plant material shows the following anatomical features- a) the vascular bundles are conjoint, scattered and surrounded by a sclerenchymatous bundle sheaths. b) Phloem parenchyma is absent. What will you identify it as? (A)

TWO MARKS QUESTIONS:

82. Name the two main groups of plant tissues. (K)
83. What are axillary buds? What do they form? (K)
84. Why are apical and intercalary meristems considered as primary meristems? (K)

85. Mention two characteristic features of permanent or mature cells of plants. (K)
86. Mention any two functions of parenchyma. (K)
87. Differentiate between Simple tissues and complex tissues(U)
88. Differentiate between Fibres and sclereids(U)
89. Differentiate between Tracheids and vessels (U)
90. Differentiate between Endarch and exarch (U)
91. Differentiate between Root hairs and trichomes(U)
92. Differentiate between Open and closed vascular bundles(U)
93. Differentiate between Radial and conjoint vascular bundles(U)
94. Differentiate between Anatomy of dicot root and monocot root(U)
95. Differentiate between Intrafascicular cambium and Interfascicular cambium. (U)
96. Differentiate between Spring wood and autumn wood(U)
97. Differentiate between heart wood and sap wood. (U)
98. Draw a neat labeled diagram showing collenchyma in cross section.(S)
99. What are complex tissues? Give any two examples. (K)
100. Name the different kinds of elements in xylem. (K)
101. List out the different functions of xylem. (K)
102. Mention the two types of primary xylem. (K)
103. Name the different components of phloem. (K)
104. Draw a neat labeled diagram showing different components of phloem in longitudinal section.(S)
105. What are companion cells? Mention their significance. (K)
106. How are sieve tube elements arranged in phloem? (K)
107. What are bast fibres? Mention any two commercially used bast fibres. (K)
108. Name the two types of primary phloem. (K)
109. What is cuticle? Write its function. (K)
110. What are stomata? Name any two processes in plants that are regulated by stomata. (K)
111. What are trichomes? How they are helpful to plants? (U)
112. Draw a diagrammatic representation of stomata.(S)
113. Formation of cambial ring in dicot root and dicot stem is not the same. Why? (A)
114. What are bulliform cells? What is their function? (K)
115. Write the difference between adaxial and abaxial surface of a dorsiventral leaf.(U)
116. Name the two types of parenchyma in the mesophyll of dicot leaves. (K)
117. Name the two lateral meristems involved in secondary growth. (K)
118. What are medullary rays? Write their function. (K)
119. What is phellogen? What does it form? (K)
120. What is bark? Mention the types. (K)
121. Draw a labeled diagram of lenticel.(S)
122. Draw a neat labeled diagram of shoot apex showing apical meristem.(S)
123. Differentiate between the stelar region of Dicot root and Dicot stem.(U)
124. Differentiate between early wood and late wood. (U)

THREE MARKS QUESTIONS:

125. Classify meristems based on their location in the plant body.(U)
126. Mention any three examples of lateral meristems. (K)
127. State the location and function of different types of meristems. (K)
128. List the different kinds of simple permanent tissues stating their location in the plant body. (K)

129. What are the important characteristic features of parenchyma? (K)
130. What are the important characteristic features of collenchyma? (K)
131. What are the important characteristic features of sclerenchyma? (K)
132. Why is sclerenchyma known as mechanical tissue? Mention the types of sclerenchyma cells. (K)
133. Explain the Parenchyma tissue with reference to their location, structure and function(U)
134. Explain the Collenchyma tissue with reference to their location, structure and function(U)
135. Explain the Sclerenchyma tissue with reference to their location, structure and function(U)
136. What is xylem? List the different elements of xylem. (K)
137. List the different types of tissue systems in plant body. (K)
138. Explain the structure of stomata.(U)
139. Differentiate between dicot stem and monocot stem with reference to ground tissue system.(U)
140. Diagrammatically represent various types of vascular bundles.(S)
141. What are the important anatomical features of Dicot root?(K)
142. What are the important anatomical features of Monocot root?(K)
143. What are the important anatomical features of Dicot stem?(K)
144. What are the important anatomical features of Monocot stem(K)
145. What are the important anatomical features of Dicot leaf?(K)
146. What are the important anatomical features of Monocot leaf?(K)
147. Both dicot and monocot roots do not posses cambium during their primary growth. Yet, dicot root begins its secondary growth, while monocot root does not. Comment. (A)
148. Which are the three sub-zones of cortex in dicot stem? (K)
149. What is secondary growth? Mention the two meristems involved in it. (K)
150. Explain how cambial ring is formed in dicot stem.(U)
151. Cork cambium forms tissues that form the cork. Do you agree with this statement? Explain.(U)
152. What is periderm? How does periderm formation take place in dicot stems? (K)

FIVE MARKS QUESTIONS:

153. Name the water conducting tissue in plants and also explain its different structural components. (U)
154. Describe the structure of phloem.(U)
155. What are complex tissues? Differentiate between xylem and phloem.(U)
156. Draw a neat labeled diagram to show the anatomical features of Dicot root(S)
157. Draw a neat labeled diagram to show the anatomical features of Monocot root(S)
158. Draw a neat labeled diagram to show the anatomical features of Dicot stem (S)
159. Draw a neat labeled diagram to show the anatomical features of Monocot stem (S)
160. Draw a neat labeled diagram to show the anatomical features of Dicot leaf(S)
161. Draw a neat labeled diagram to show the anatomical features of Monocot leaf(S)
162. Differentiate between the anatomy of Dicot root and monocot root (U)
163. Differentiate between the anatomy of Dicot stem and monocot stem(U)
164. Differentiate between the anatomy of Dicot leaf and monocot leaf(U)
165. Write an account of role of vascular cambium during secondary growth.(U)
166. Describe the internal structure of a dorsiventral leaf with the help of labeled diagrams.(U)
167. What is cork cambium? Explain its role in secondary growth.(U)
168. Summarize the process of secondary growth in dicot stem.(U)
169. What are annual rings? How are they formed? What is their significance? (K)
170. Explain the different structures of epidermal tissue system and state their function.(U)
171. Explain the process of secondary growth in the stems of woody angiosperms with the help of schematic diagrams. What is its significance? (U)

172. With respect to secondary growth in plants, define the following terms. (K)

a. Phellum b. Phellogen c. Phelloderm d. Bark e. Lenticel

CHAPTER 7: STRUCTURAL ORGANISATION IN ANIMALS

ONE MARK QUESTIONS:

1. What is a tissue? (K)
2. What is epithelial tissue? (K)
3. What is the function of compound epithelium? (K)
4. What is glandular epithelium? (K)
5. What are exocrine glands? (K)
6. What are endocrine glands? (K)
7. What are cell junctions? (K)
8. Write the function of Tight junction. (K)
9. Write the function of Adhering junction. (K)
10. Write the function of Gap junction. (K)
11. Why connective tissues are called so? (U)
12. Name the structural proteins found in connective tissue. (K)
13. Where do you find adipose tissue? (K)
14. Name the cells of cartilage. (K)
15. Name the cells of Bone. (K)
16. What are ligaments? (K)
17. What are tendons? (K)
18. What is the function of a myofibril? (K)
19. In which muscle tissue intercalated discs are present? (K)
20. Name the excitable cells of neural system. (K)
21. Write the function of neuroglial cells. (K)
22. Why organ system (level of organisation) is essential for multicellular organism? (U)
23. What is haemocoel? (K)
24. What is haemolymph? (K)
25. What is clitellum? (K)
26. What is the function of calciferous glands? (K)
27. What is Typhlosole? (K)
28. What is the significance of typhlosole? (U)
29. Name the excretory organs of Earthworm. (K)
30. How does an earthworm respire? (U)
31. Name the locomotory structure in earthworm. (K)
32. What is the function of spermathecae? (K)
33. Where does fertilization and development occur in earthworm? (K)
34. What is the function of clitellum? (K)
35. Development of earthworm is direct. Why? (U)
36. What is vermicomposting? (K)
37. What is the use of earthworm in fishing? (K)
38. Write the scientific name of Cockroach. (K)
39. Write the common name of *Periplaneta americana*. (K)
40. What are sclerites? (K)
41. What is tegmina? (K)
42. What is arthroidal membrane? (K)
43. What is the function of antennae in Cockroach? (K)
44. What is mosaic vision? (K)

45. Write the function of forewings of Cockroach. (K)
46. Write the function of hindwings of Cockroach. (K)
47. What are spiracles? (K)
48. Name the tubules of cockroach's alimentary canal that secretes digestive enzymes. (K)
49. Name the respiratory organs of Cockroach. (K)
50. Name the excretory organ of cockroach. (K)
51. Why is Cockroach uricotelic? (U)
52. What are ommatidia? (K)
53. What are oothecae? (K)
54. Development of Cockroach is paurometabolous. What does it mean? (U)
55. How many pairs of spiracles are found in Cockroach? (K)
56. Write the function of prostomium of *Pheretima*. (K)
57. Name the first segment of Earthworm. (K)
58. What is mimicry? (K)
59. Frogs are ureotelic. Why? (U)
60. How many pairs of cranial nerves are found in frog? (K)
61. Name the process of development of tadpole of frog into adult. (K)
62. What is aestivation in animals? (K)
63. What is hibernation? (K)
64. How does respiration take place during aestivation and hibernation? (U)

TWO MARKS QUESTIONS:

65. Name four basic types of animal tissues. (K)
66. Classify the glandular epithelium based on the mode of releasing secretory products? (U)
67. Name the types of glandular epithelium? (K)
68. Draw a neat labelled diagram of cardiac muscle. (S)
69. Draw a neat labelled diagram of skeletal muscle. (S)
70. Draw a neat labelled diagram of Adipose tissue. (S)
71. Differentiate between dense and loose connective tissue. (U)
72. Differentiate between bone and cartilage. (U)
73. Mention the types of specialised connective tissue. (K)
74. Name the two common earthworms of India. (K)
75. Give two reasons why Earthworms are known as 'friends of farmers'. (U)
76. What are tergites and sternites? (K)
77. List the different excretory structures in Cockroach. (K)
78. Write a note on the proventriculus of Cockroach. (U)
79. Why cockroaches are considered as serious pests? (U)
80. Write two distinct characters of male frogs. (K)
81. Name the types of respiration in frog. (K)
82. List the different sense organs present in frog. (K)
83. Differentiate between male & female cockroach.(U)

THREE MARKS QUESTIONS:

84. Write the general characters of Epithelial tissue. (U)
85. Mention the types of epithelial tissue. (K)
86. Classify simple epithelium based on structural modification of cells. (U)
87. Name the three types of simple epithelium with one function of each. (K)

88. Write a note on compound epithelium. (U)
89. Explain three types of cell junctions. (U)
90. List the functions of collagen/elastin fibres. (K)
91. Classify connective tissue. (U)
92. Draw a neat labelled diagram of areolar connective tissue. (S)
93. What are the general characters of muscle tissue?
94. What are the three types of Muscle tissue and mention their location in human body. (U)
95. Differentiate Skeletal muscle from smooth muscle (U)
96. Write any three differences between skeletal muscle and cardiac muscle. (U)
97. Distinguish smooth muscle from cardiac muscle. (U)
98. Name the three types of nephridia of earthworm. (K)
99. List the cellular components of blood. (K)
100. Write a short note on Sensory system of Earthworm. (U)
101. Name the three segments of thorax of Cockroach. (K)
102. Why Cockroach has mosaic vision? Explain. (U)
103. Write a note on Endocrine system of Frog. (U)
104. Briefly explain the Neural system/Nervous system of Frog. (U)
105. Briefly explain sensory system of Frog. (U)
106. Write three benefits of frogs. (K)

FIVE MARKS QUESTIONS:

107. Give an account of general features and types of connective tissue. (U)
108. Explain the morphology of Earthworm. (U)
109. Explain the digestive system of Earthworm. (U)
110. Briefly explain the process of digestion in Earthworm. (U)
111. Explain the circulatory system of earthworm with a neat labelled diagram. (U)
112. Briefly explain circulation in Earthworm. (U)
113. Draw a neat labelled diagram of reproductive system of Earthworm. (S)
114. Explain reproduction in Earthworm. (U)
115. Draw a neat labeled diagram of Cockroach showing its external features. (S)
116. Draw a neat labelled diagram of digestive system of cockroach. (S)
117. Explain digestion in Cockroach. (U)
118. Write a neat labelled diagram of male reproductive system of Cockroach. (S)
119. Write a neat labelled diagram of female reproductive system of Cockroach. (S)
120. Enumerate morphological features of Frog. (U)
121. Draw a neat labelled diagram of digestive system of Frog. (S)
122. Explain the process of digestion in Frog. (U)
123. Explain circulation/vascular system in Frog. (U)
124. Describe the process of excretion in Frog. (U)
125. Explain the nervous of system of Frog. (U)
126. Briefly explain endocrine system and sensory system in frog (U)
127. Draw a neat labelled diagram of male reproductive system of frog. (S)
128. Draw a neat labelled diagram of female reproductive system of frog. (S)

UNIT 3: CELL STRUCTURE AND FUNCTION

CHAPTER 8: CELL: THE UNIT OF LIFE

ONE MARK QUESTIONS

1. Name the fundamental, structural and functional unit of life. (K)
2. Which is the basic unit of life? (K)
3. What is a cell? (K)
4. Who observed the cell for the first time? (K)
5. Who formulated the 'cell theory'? (K)
6. What does *'omnis cellula-e-cellula'* mean?
7. Who proposed the modified 'cell theory'? (K)
8. What are prokaryotes? (K)
9. What are eukaryotes? (K)
10. Which region is the main area of cellular activities in a cell? (K)
11. Give an example of smallest cell. (K)
12. Which is the largest isolated single cell? (K)
13. Name the outermost layer of cell envelope in bacteria. (K)
14. What are inclusion bodies? (K)
15. Name non-membrane bound cell organelle found only in animal cells. (K)
16. What are plasmids? (K)
17. What do you call a small circular DNA found outside genomic DNA of bacteria? (K)
18. What is the function of plasmid? (K)
19. What is glycocalyx? (K)
20. What do u call a bacteria which takes up Gram's stain? (K)
21. What are pili? (K)
22. Who proposed 'fluid mosaic model' of plasma membrane? (K)
23. The hydrophobic tails of lipids are towards the inner part. Why? (U)
24. What is the lipid component of membrane made up of? (K)
25. Why is the cell membrane structure called as 'fluid' model? (U)
26. What is the movement of water by diffusion called? (K)
27. What is diffusion? (K)
28. Give an example for active transport. (K)
29. Name the component of the middle lamella. (K)
30. What is the function of the middle lamella. (K)
31. What is plasmodesmata? (K)
32. What is the function of plasmodesmata? (K)
33. Which type of endoplasmic reticulum is involved in lipids/steroidal hormones? (K)
34. Which organelle is involved in the synthesis of steroidal hormone synthesis? (K)
35. RER is frequently of observed in cells with secretory function. Why? (U)
36. Why mitochondria and chloroplast are not included under endomembrane system. (U)
37. Who discovered Golgi Apparatus? (K)
38. What is tonoplast? (K)

39. Name the membrane of vacuole. (K)
40. Why is the concentration of vacuolar sap always higher? (A)
41. Which organelle synthesizes lysosomes? (K)
42. What is the content of the lysosome vesicles? (K)
43. Write the function of contractile vacuole of Amoeba. (K)
44. What is the role of cristae in mitochondria? (K)
45. Why mitochondria are called as the 'power house' of the cell? (U)
46. How do mitochondria multiply? (K)
47. What are plastids? (K)
48. Name the plastid which stores proteins. (K)
49. Name the plastid which stores Starch. (K)
50. Name the plastid which stores oils and fats. (K)
51. What are chromatophores? (K)
52. What are thylakoids? (K)
53. How many chloroplasts are found in *Chlamydomonas*? (K)
54. Name the plant cell which has one chloroplast. (K)
55. Where do you find chlorophyll pigments? (K)
56. What is the name of a stack of thylakoids? (K)
57. Who discovered ribosomes? (K)
58. What is a polysome? (K)
59. Name the non-membrane bound cell organelle (K)
60. Name the site of rRNA synthesis. (K)
61. Cilia functions like oars. Justify. (U)
62. Name the structure from which cilia and flagella arise. (K)
63. What is centrosome made up of? (K)
64. What are the fibrils of centrioles made up of? (K)
65. Who discovered the nucleus of a cell? (K)
66. What is the function of Nucleolus? (K)
67. What are kinetochores? (K)
68. What is a centromere? (K)
69. What are microbodies? (K)

TWO MARKS QUESTIONS

70. State 'cell theory'. (K)
71. Briefly explain the modified cell theory. (U)
72. List four types of organisms that represent prokaryotic cell. (K)
73. Name the four basic shapes of bacteria. (K)
74. What are plasmids? Mention any one special character conferred by plasmids. (K)
75. Distinguish Gram positive bacteria from Gram negative bacteria. (U)
76. What are mesosomes? Mention any one function. (K)
77. Classify the bacteria based on Gram's staining. (U)
78. Differentiate between pili and fimbriae. (U)
79. What are inclusion bodies? Give an example. (K)
80. Write the importance of fluid nature of plasma membrane. (K)

81. Classify the membrane proteins based on the ease of extraction. (U)
82. What is active transport? Give an example. (K)
83. Write the benefits of fluid nature of the membrane. (K)
84. Mention any four functions of cell wall. (K)
85. Name the four endomembrane organelles. (K)
86. Why mitochondria, chloroplast and peroxisomes though membranous are not a part of endomembrane system? (A)
87. Name two types endoplasmic reticulum with any one function of each. (K)
88. Name the compartments created by ER in the intracellular space. (K)
89. Sketch and label Golgi apparatus. (S)
90. Name the two faces of cisternae of Golgi Apparatus. (K)
91. Write the functions of cis and trans face of Golgi Apparatus. (K)
92. List out the functions of Golgi Apparatus. (K)
93. List the hydrolytic enzymes present in Lysosomes. (K)
94. Name the vacuoles found in Amoeba and protists.
95. Write the functions of vacuole. (K)
96. What are the contents of stroma of chloroplast? (K)
97. Mention the cell organelles which contain both DNA and ribosomes. (K)
98. List the types of ribosomes found in prokaryotes and eukaryotes. (K)
99. Write the components of ribosomes. (K)
100. What does 'S' stand for in 70s type of ribosomes? (U)
101. Write the functions of cytoskeleton. (U)
102. Draw a diagram of cilia depicting internal structure of cilia. (S)
103. Write the functions of Nuclear pores. (K)
104. Name the animal cell and plant cell which lack Nucleus. (K)
105. What is chromatin made up of? (K)
106. Classify the chromosomes based on the position of centromere. (U)
107. List four types of chromosomes based on position of centromere. (U)
108. Draw diagrams of four types of chromosomes based on centromere. (S)
109. What are satellites? (K)

THREE MARKS QUESTIONS

110. Multicellular organisms have division of labour. Explain. (U)
111. Cell is the basic unit of life. Discuss in brief. (U)
112. Write a short note on Glycocalyx. (K)
113. List any six functions of mesosomes. (U)
114. Name the three components of bacterial flagellum. (K)
115. List out the functions of plasma membrane. (K)
116. List out the chemical components found in cell wall of algae and plants. (K)
117. Write a short note on cell wall (U)
118. Draw a neat labelled diagram of Endoplasmic reticulum. (S)
119. Differentiate smooth endoplasmic reticulum from rough endoplasmic reticulum. (U)
120. Briefly explain the structure of Golgi Apparatus? (U)

121. Write a short note on functions of Golgi Apparatus. (U)
122. Draw a neat labelled diagram of Mitochondria? (S)
123. What are the contents of mitochondrial matrix and what is their function? (K)
124. Classify the plastids based on the type of pigments they contain? (U)
125. List different types of plastids. (K)
126. Explain the three types of plastids. (U)
127. List the three different types of Leucoplasts & mention the type of reserve food material they store. (K)
128. Draw a neat labelled diagram of chloroplast. (K)
129. Write a short note on centrosome. (U)
130. Explain hub and spokes with respect to centrioles. (U)
131. What is cytoskeleton? Write any two functions. (K)
132. Draw a neat labelled diagram of nucleus. (S)
133. Mention the functions of the following: (k)
    a) Endoplasmic reticulum
    b) Ribosomes
    c) Mitochondria
134. Which organelle is called Packaging apparatus & why? (U)
135. Draw a labelled diagram depicting internal structure of cilia.(S)

FIVE MARKS QUESTIONS:

136. Describe the structure of prokaryotic cell. (U)
137. List out the salient features of prokaryotic cell. (K)
138. Write any five differences between prokaryotic cell and eukaryotic cell. (U)
139. Draw a neat labelled diagram of plant cell. (S)
140. Draw a neat labelled diagram of animal cell. (S)
141. Distinguish plant cell from animal cell. (U)
142. Explain Fluid Mosaic Model of plasma membrane. (U)
143. Explain the structure of mitochondria with a neat labelled diagram. (U)
144. Describe the structure of chloroplast with a neat labelled diagram. (U)
145. Describe the structure of sectional view of cilia with the help of a diagram. (U)
146. Explain the structure of nucleus with a neat labelled diagram. (U)
147. Describe the structure of chromosome. (U)
148. Name the organelles in which following structures are found: (K)
    a) Cisternae
    b) Cristae
    c) Thylakoids
    d) Nucleolus
    e) Tonoplast
149. a) Classify the chromosomes based on the position of centromere. (U)
    b) Many nucleoli are found in cells involved in protein synthesis. Why? (U)
    c) Draw a neat labelled diagram of Nucleus. (S)

150. Name the following:
    a) Power house of the cell
    b) Site of steroidal hormone synthesis
    c) Reservoir of hydrolytic enzymes
    d) Packaging units of cell
    e) Locomotory structures of cell

CHAPTER 9: BIOMOLECULES

ONE MARK QUESTIONS:

1. What are biomolecules? [K]
2. Name the abundant chemical compound present in the body of living organisms. [K]
3. Name the chemical compound used to grind tissue during chemical analysis of organic compound. [K]
4. What are metabolites? [K]
5. What are primary metabolites? [K]
6. What are secondary metabolites? [K]
7. What is the weight range of macromolecules in Daltons? [K]
8. What is the weight range of micro molecules in Daltons? [K]
9. Name the building blocks of proteins. [K]
10. What are peptide bonds? [K]
11. Name the components of amino acids. [K]
12. What are alpha-amino acids? [K]
13. Give an example for neutral amino acids? [K]
14. Give an example for aromatic amino acid? [K]
15. What do you mean by zwitter ion? [K]
16. Which group is responsible for exhibiting physical and chemical properties of amino acids? [K]
17. What are polysaccharides? [K]
18. What are homo polysaccharides? [K]
19. Which polysaccharide is called as animal starch? [K]
20. Which colour is produced when starch reacts with iodine? [K]
21. Why does starch turns blue black with iodine? [R]
22. What are hetero polysaccharides? [K]
23. Name the macromolecule that forms the hereditary determinants of the living organisms. [K]
24. Name the protein which forms the most abundant protein in animal world. [K]
25. Name any one homo- polysaccharide. [K]
26. Name the protein that is most abundant in the Plant world. [K]
27. Which compound is a polymer of fructose? [K]
28. Expand RNA? [K]
29. Name the bond which links two monosaccharides. [K]
30. Name the bond which links amino acids. [K]
31. What is an ester bond? [K]
32. What is a phosphodiester bond? [K]
33. Who proposed the double helical structure of DNA? [K]
34. Give an example for a purine found in DNA. [K]
35. What are enzymes? [K]
36. Why enzymes are called as biocatalysts? [R]
37. Name the bond present between two nucleotides. [K]
38. Name any one Nucleotide. [K]
39. How many weak hydrogen bonds are present between adenine and thymine? [K]
40. How many weak hydrogen bonds are present between cytosine and guanine? [K]
41. How many base pairs present in one full turn of helical strand of DNA. [U]
42. What is the length of one full turn of helical strand of DNA? [K]
43. What is the distance between two base pairs? [K]
44. What are ribozymes? [K]

45. What are active sites of enzymes? [K]
46. At what temperature enzymes get damaged. [U]
47. What is the general rule of thumb regarding a chemical reaction with respect to temperature? [K]
48. What are transferases? [K]
49. Write the expression for rate of a physical or a chemical process. [U]
50. Which factor mainly influences the rates of physical and chemical process during the reaction? [K]
51. Name the acid produced by skeletal muscles during anaerobic conditions. [K]
52. Name the acid produced by skeletal muscles during aerobic conditions. [K]
53. Name the end product formed in yeast during fermentation. [K]
54. What is a substrate? [K]
55. What is inhibition? [K]
56. What is inhibitor? [K]
57. Give an example for inhibitor. [K]
58. Which compound is known as competitive inhibitor? [K]
59. Where do you use Competitive inhibitors? [A]
60. What are co-factors? [K]
61. What is the function of co-factor? [K]
62. What is Apo-enzyme? [K]
63. What are co-enzymes? [K]
64. Name the essential chemical component of many co-enzymes. [K]
65. Name the vitamin present in co-enzyme NAD and NADP. [K]
66. What happens when the co-factor is removed from the enzyme? [U]
67. What are fatty acids? [K]
68. Name the fatty acid with 16 carbon atoms. [K]
69. Name the fatty acid with 20 carbon atoms. [K]
70. What do you call fatty acid without double bond? [K]
71. What do you call fatty acid with double bond? [K]
72. Name the chemical name of glycerol. [K]
73. What are phospholipids? [K]
74. Where are phospholipids found? [K]
75. Give an example of phospholipids. [K]
76. Name the polysaccharide found in exoskeleton of arthropods. [K]
77. What is the polysaccharide found in cotton fibre? [K]
78. Which is the most abundant protein in the whole of biosphere? [K]
79. What is DNA? [K]
80. What is RNA? [K]
81. Give an example for quaternary structure of protein. [U]
82. What is the dynamic state of body constituents? [K]
83. What is anabolic pathway? [K]
84. What is biosynthetic pathway? [K]
85. What is catabolic pathway? [K]
86. Name the energy currency of living system. [K]
87. What is the living state?[K]
88. What is metabolic pathway? [K]
89. What are oxidoreductases? [K]
90. What are hydrolases? [K]
91. What are lyases? [K]
92. What are isomerases? [K]

93. What are ligases? [K]

TWO MARKS QUESTIONS:

1. Name the inorganic compound found in living organisms(K)
2. Write the difference between fats and oils. [K]
3. What are competitive inhibitors? Give an example. [K]
4. Write the structural formula for amino acid Alanine. [S]
5. Write the structural formula for amino acid Serine. [S]
6. Write the structural formula for amino acid Glycine. [S]
7. Write any two differences between saturated and unsaturated fatty acids. [U]
8. What are phospholipids? Give one example. [K]
9. What are Nucleosides? Give an example. [K]
10. Write the any four functions of proteins. [U] 147
11. Write difference between Nucleoside & Nucleotide
12. Write the cyclic structure of glucose and ribose. [S]
13. What do you call first amino acid and last amino acid in a polypeptide chain? [K]
14. Write any two differences between primary and secondary metabolites. [U]
15. What is the significance of Nucleic acid? [U]
16. What is anabolic pathway? Give an example. [K]
17. What is catabolic pathway? Give an example. [K]
18. Write the graphical representation of temperature and pH on enzyme activity. [U]
19. Write any two differences between nucleoside and nucleotide. [U]
20. Amino acids are called α-amino acids and substituted amino acids. Justify. [U]
21. Nucleotides are phosphorylated nucleosides. Justify. [U]
22. Name the four types proteins based on structure. [U]

THREE MARKS QUESTIONS:

1. The power of enzyme is incredible. Explain this with synthesis of carbonic acid as an example. [R]
2. Write a note on three factors affecting enzyme activity. [K]
3. Write any three salient features of B-DNA. [U]
4. What are the three distinct components of a nucleotide? [K]
5. Explain: (a) Peptide bond (b) glycosidic bond (c) phosphodiester bond. [U]
6. Write the reaction to show how phosphodiester bond occurs between two nucleotides. [U]
7. What are essential and non essential amino acids? Give one example for each. [K]
8. What are apoenzymes? How they catalyses the biochemical reaction? Give an example. [K]
9. Briefly explain three kinds of co-factors. [U]
10. Classify the amino acids based on number of amino group and carboxyl group with one example. [U]
11. Give 3 examples of complex polysaccharides in nature. [K]

FIVE MARKS QUESTION:

1. Explain the factors affecting enzyme activity in biochemical reaction. [U]
2. Explain the characters of enzymes. [U]
3. Explain the steps involved in enzyme action. [U]
4. Write the classification of enzymes based on reactions with example. [U]
5. Explain how do enzymes bring about high rate of chemical conversions? [U]

6. Explain the secondary structure of DNA. [U]
7. What is the dynamic state of body constituents and how is it related to metabolism. [U]
8. What are proteins? Write four functions of proteins. [K]
9. Explain with a graphical representation how do enzymes bring about such high rates of chemical conversions? [U]
10. What is Enzyme-substrate complex? Write the four steps of catalytic cycle of an enzyme. [K]

CHAPTER 10: CELL CYCLE AND CELL DIVISION

ONE MARK QUESTIONS:

1. Define cell cycle. [K]
2. The events of the cell cycle are under genetic control. Why? [R]
3. What is the approximate duration for human cells to divide? [K]
4. Which phase is present between two successive M-phase of the cell cycle? [K]
5. What happens during G_1 phase? [K]
6. What happens during S phase? [K]
7. What happens during G_2 phase? [K]
8. Define Karyokinesis. [K]
9. Define cytokinesis? [K]
10. Name the resting phase of cell cycle? [K]
11. What is the chromosome number of onion? [K]
12. How many chromosomes will the onion cell have at G_1 phase? [U]
13. During which phase DNA replication takes place? [K]
14. What is G_0 or quiescent phase of cell cycle? [K]
15. During which phase of mitosis initiation of condensation of chromosomal material takes place. [K]
16. Chromosomes appear clearly under microscope at which stage of M-phase. [K]
17. What are Kinetochores? [K]
18. During which stage of mitosis, can we study the morphology of chromosomes? [K]
19. What is the importance of Kinetochores? [K]
20. What do you mean by metaphase plate? [K]
21. What is cell plate? [K]
22. Which cell division is also called as equational division? [K]
23. Why mitosis is called equational cell division? [R]
24. Which cell division is responsible for the formation of gametes? [K]
25. Define Mitosis. [K]
26. Define Meiosis. [K]
27. Name the cell division which is responsible for production of diploid daughter cells. [K]
28. Name the cell divisions which come across only during gametogenesis? [K]
29. During which stage of meiosis synopsis occurs. [K]
30. What do you mean by crossing over? [K]
31. Name the enzyme involved in crossing over. [K]
32. Name the stage of prophase- I of meiosis during which recombination nodules are formed. [K]
33. What is the significance of crossing over? [K]
34. What are recombination nodules? [K]
35. What do you mean by chiasmata? [K]
36. Name the stage of prophase- I of meiosis during which chiasmata is formed. [K]
37. Terminalisation of chiasmata occurs during which stage of prophase-I. [K]
38. What is interkinesis? [K]
39. Which is the last stage of prophase-I? [K]
40. At the end of meiosis how many haploid cells are formed? [U]
41. What is a bivalent? [K]
42. Which is the first stage of prophase-I? [K]

TWO MARKS QUESTIONS:

1. Why mitosis is called as equational division. Justify. [R]
2. What are the organelles which disappear at the end of prophase in mitosis? [K]
3. Explain how syncytium condition is formed in some organisms. Give an example for it. [U]
4. Write difference between Animal and Plant mitotic division with respect to ploidy. [U]
5. Draw a neat labeled diagram of cell cycle. [S]
6. Mention the four phase of Mitosis. [U]
7. Describe the events taking place during interphase. [S]
8. Name the two basic phases of cell cycle. [K]

THREE MARKS QUESTIONS:

1. Write the significance of Meiosis. [U]
2. Explain Prophase of Mitosis. [U]
3. Explain Metaphase of mitosis. [U]
4. Explain Anaphase of mitosis. [U]
5. Draw a neat labeled diagram of Metaphase and Anaphase of mitosis. [S]
6. Write a note on Diplotene of prophase-I of meiosis. [U]
7. Write a note on pachytene of prophase-I of meiosis. [U]
8. Name the cell organelles which reappear after Telophase in mitosis. [K]
9. What are the events of Diplotene stage?(K)
10. What are the events of Pachytene stage?(K)

FIVE MARKS QUESTIONS:

1. With neat labeled diagram explain the events of cell cycle. [S]
2. Explain the stages of mitosis with neat labeled diagram. [S]
3. Describe the events of prophase-I of meiosis-I. [S]
4. Differentiate between mitosis and meiosis. [S]
5. Explain meiosis-II with neat labeled diagram. [S]
6. Write the significance of mitosis. [U]
7. Explain how cytokinesis occurs in plant cell and animal cell. [S]
8. Explain the process of cytokinesis in Mitosis. [U]
9. With respect to Meiosis – Define the following. [K]
   a) Bivalent b) Recombination nodules c) Crossing over
   d) Recombination e) Chiasmata

UNIT 4: PLANT PHYSIOLOGY

CHAPTER 11: TRANSPORT IN PLANTS

ONE MARK QUESTIONS:

1) What is diffusion? (K)
2) Define facilitated diffusion. (K)
3) What are porins?(K)
4) What is passive transport?(K)
5) Define uniport. (K)
6) Define symport.(K)
7) Define antiport.(K)
8) What are pumps, with reference to active transport in plants?(K)
9) What is water potential? (K)
10) What is concentration gradient?(K)
11) Which is the symbol of water potential? (K)
12) What is the conventional value of pure water at standard temperature?.(K)
13) Define solute potential.(K)
14) Define pressure potential.(K)
15) Define osmosis.(K)
16) What is plasmolysis?(K)
17) How does plasmolysis occur?
18) What is isotonic solution? (K)
19) What is hypotonic solution? (K)
20) What is hypertonic solution? (K)
21) What happens to a cell if it is kept in hypotonic solution? (U)
22) What happens to a cell if it is kept in hypertonic solution? (U)
23) What is turgor pressure?(K)
24) Define imbibition. (K)
25) What is translocation in plants ?(K)
26) What is apoplast?(K)
27) What is symplast?(K)
28) What is a mycorrhiza?(K)
29) What is root pressure?(K)
30) Define transpiration. (K)
31) Define guttation .(K)
32) Define cohesive force .(K)
33) Define adhesive force.(K)
34) Define capillarity.(K)
35) What is transpiration pull? (K)
36) Which is the only means for gaseous movement within the plant ?(K)
37) What are membrane proteins?(K)
38) Diffusion of any substance across a membrane depends on its solubility in lipids. Why?(A)
39) What are water channels called ?(K)
40) A seed though it appears dry is alive and respiring. How?(U)
41) Terrestrial plants take up huge amounts of water daily. Why?(K)

42) How is water potential expressed?(K)
43) Name the structure that connects protoplasts of neighbouring plant cells.(K)
44) *Pinus* seeds cannot germinate and establish without the presence of mycorrhiza . Why?(K)
45) Why guttation occurs at night and early morning ?(A)
46) Which is the immediate cause of the opening and closing of stomata?(K)
47) Orientation of the microfibrils in the cell was of the guard cells also play on important role in opening and closing of stomata -Justify.(U)
48) What is meant by saturation in transport? (K)
49) Why is endodermis of root impervious to water? (U)
50) Name a simple experiment that is used to identify the tissues of food transportation. (K)
51) When does a cell become flaccid ?(K)
52) What do you mean by mineral remobilization? (U)
53) How many types of aquaporins make up water channels? (K)

TWO MARKS QUESTIONS:

1) Facilitated diffusion cannot cause net transport of molecules from a low to a high concentration region. Substantiate the statement. (U)
2) What are porins? What is their role in diffusion? (K)
3) Active transport occurs “against concentration gradient" . Justify the statement(A)
4) Define water potential. Mention its components. (K)
5) Explain why pure water has maximum water potential.(U)
6) Differentiate between diffusion and osmosis.(U)
7) Differentiate between imbibition and diffusion .(U)
8) The process of plasmolysis is reversible. Justify.(U)
9) Differentiate osmotic pressure and osmotic potential.(U)
10) Explain how mycorrhizae are helpful in absorption of water and mineral salts.(U)
11) Differentiate between Transpiration and Guttation .(U)
12) Draw a labelled diagram of stomatal apparatus. (S)
13) Explain the girdling experiment to demonstrate phloem transport.(U)
14) Phloem transport is bidirectional -justify the statement. (A)
15) All solutions have a water potential lower than pure water. Justify. (U)
16) Water potential of a solution is always negative. Why?(A)
17) Write two characteristics of facilitated diffusion .(K)
18) Write a note on cohesion-tension-transpiration pull model of water transport. (U)
19) What is mass flow movement or Bulk flow movement ? How is it achieved?(K)
20) List plant factors that affect transpiration.(K)
21) List external factors that affect transpiration.(K)
22) What do you mean by high tensile strength and high capillarity?(K)

THREE MARKS QUESTIONS:

1) What is passive transport ?Explain the types .(K)
2) Define water potential. Explain the relationship between water potential and its components .(U)
3) “Uptake of most of the mineral ions occurs only by Active absorption” . Explain.(A)
4) Explain the role of root endodermis in mineral absorption .(U)
5) Explain - whether water is pushed or pulled through the plant.(U)

6) Explain the mechanism of opening of stomata.(U)
7) Explain the three physical properties of water.(U)
8) "Water is often the limiting factor for plant growth and productivity" - Justify with examples .(A)
9) Movement of substances in phloem is bidirectional -Explain .(A)
10) Name the regions of a plant where you find chief mineral sinks.(K)
11) What is girdling experiment?

FIVE MARKS QUESTIONS:

1) With a neat labelled diagram explain the thistle funnel experiment.(S)
2) With the help of labelled diagrams explain the process of plasmolysis.(S)
3) With a neat labelled diagram explain the absorption of water by the root form the soil.(S)
4) Explain the transpiration pull model of water transport in plants.(U)
5) Discuss the factors (forces) responsible for ascent of sap in plant .(A)
6) Xylem transport is unidirectional but phloem transport is bidirectional. Explain .(U)
7) Explain mass flow or pressure flow hypothesis.(U)
8) Explain how opening and closing of stomata occurs during transpiration .(U)
9) Explain the importance (Significance) of transpiration .(U)
10) Explain Apoplastic movement of water .(U)
11) Explain symplastic movement of water .(U)
12) Explain the translocation process from source to sink according to pressure flow hypothesis .(U)

CHAPTER 12: MINERAL NUTRITION

ONE MARK QUESTIONS:

1. What is hydroponics?(K)
2. Who demonstrated the technique of hydroponics?(K)
3. What is a Micronutrient?(K)
4. What is a Macronutrient?(K)
5. What is critical concentration?(K)
6. What is meant by mineral deficiency symptom?(K)
7. What is Chlorosis?(K)
8. What is Necrosis?(K)
9. When do we consider mineral ion concentration as toxic? (K)
10. When do we call an element as deficient?(K)
11. Define-flux. (K)
12. Which is the path of mineral salts from root to aerial parts of the plants?(K)
13. Which is the reservoir of essential elements?(K)
14. How does soil get enriched with dissolved ions and inorganic salts?(K)
15. The role of minerals in plant nutrition is referred to as mineral nutrition. Why?(K)
16. What is meant by nitrogen fixation? (K)
17. What is ammonification?(K)
18. What is nitrification?(K)
19. Name two nitrifying bacteria.(K)
20. What is denitrification?(K)
21. Mention the name of a denitrifying bacteria. (K)
22. What is biological nitrogen fixation? (K)
23. Name the enzyme involved in the reduction of nitrogen in to ammonia.(K)
24. Give an example for leguminous symbiotic nitrogen fixing bacteria.(K)
25. Give an example for non leguminous symbiotic nitrogen fixing bacteria.(K)
26. Why the central part of a root nodule appears pink in colour?(K)
27. What is leg haemoglobin?(K)
28. What is an infection thread?(K)
29. Mention the enzyme involved in reductive amination.(K)
30. Mention the enzyme involved in trans amination.(K)
31. Name the amino acid that transfers its amino group to other keto acids during transamination. (K)
32. How many ATP molecules are required for the production of each ammonia molecule during ammonification?(K)
33. Which is the source of ATP for reduction of nitrogen in to ammonia? (K)
34. Name the element which helps in opening and closing of stomata. (K)
35. Name the element which activates enzyme Nitrogenase in symbiotic nitrogen fixation. (K)
36. Give an example of non leguminous plant with root nodules. (K)

TWO MARKS QUESTIONS:

1. All the elements found in the plants are not essential elements. Justify the statement. (A)
2. Draw a labelled diagram to show a typical set-up for nutrient solution culture. (S)
3. Mention the physiological role and deficiency symptoms of phosphorus.(K)

4. Mention the physiological role and deficiency symptoms of nitrogen.(K)
5. Mention the physiological role and deficiency symptoms of potassium.(K)
6. Mention the physiological role and deficiency symptoms of calcium.(K)
7. Mention the physiological role and deficiency symptoms of magnesium.(K)
8. Mention the physiological role and deficiency symptoms of sulphur.(K)
9. Mention the physiological role and deficiency symptoms of Iron.(K)
10. Mention the physiological role and deficiency symptoms of manganese.(K)
11. Mention the physiological role and deficiency symptoms of copper.(K)
12. The presence of any element in excess may induce the deficiency of some other element. How?(A)
13. Mention any four organic substances found in plants in which nitrogen is one of the constituents.(U)
14. Mention any four sources of nitrogen oxides in nature. (K)
15. What is nitrification? Mention the names of any two nitrifying bacteria. (K)
16. What are chemoautotrophs? Give two examples. (K)
17. Explain the process of nitrification. (U)
18. Explain the fate of nitrate in the plants. (U)
19. What are nitrogen fixers? Give two examples. (K)
20. Differentiate between free living and symbiotic nitrogen fixers. (U)
21. Name two free living nitrogen fixing bacteria. (K)
22. Name two cyanobacteria which are free living nitrogen fixers. (K)
23. Give two examples of symbiotic nitrogen fixers. (K)
24. What are root nodules? Mention two plants in which root nodules are found. (K)
25. Leg-haemoglobin acts as oxygen scavenger. Justify the statement.(A)
26. The symbiotic nitrogen fixers like *Rhizobium* can live as both aerobes and anaerobes. Explain.(A)
27. Explain reductive amination. (U)
28. Explain transamination. (U)
29. Name the two amides which are the structural parts of proteins in plants. (K)
30. Name the compounds which have more nitrogen content than amino acids in plants. (K)
31. Differentiate between macronutrients & micronutrients. Give two examples for each. (U)
32. Name any two denitrifying bacteria. (K)

THREE MARKS QUESTIONS:

1. Explain the criteria for considering an element as essential.(U)
2. While conducting hydroponics experiment purification of water and nutrient salts is essential. Why?(A)
3. 'All elements which are present in a plant need not be essential to its survival'. Comment. (A)
4. In some plants, deficiency symptoms appear first in younger parts while in some plants they appear in older parts . Why?(U)
5. What is leg – haemoglobin? Explain its role in symbiotic nitrogen fixation.(U)
6. The activity of the enzyme nitrogenase requires anaerobic condition. How this condition is met in the root nodules? (A)
7. What are beneficial elements? Give any four examples. (K)
8. Deficiency symptoms appear both on older & younger tissues. Substantiate with reasons. Give examples. (A)
9. Mobility of elements within plants is of great significance and importance to agriculture and horticulture. Explain. (U)
10. What is flux? Differentiate between influx and efflux. What are the major metabolic functions of essential elements? (K)
12. List three elements which act as activators of enzymes. Give three examples to substantiate it.(K)
13. Which are the three different means by which atmospheric nitrogen is fixed into soil? (K)

FIVE MARKS QUESTIONS:

1. With a neat labelled diagram explain hydroponics method to study essentiality of an element. (S)
2. Explain the different categories of essential elements based on their diverse functions. (U)
3. Explain the physiological role of the following elements. (U)
   a) Nitrogen b) Phosphorous c) Potassium d) Calcium e) Magnesium
4. Explain the physiological role of the following elements.(U)
   a) Sulphur b) Iron c) Manganese d) Zinc e) Copper
5. Explain the physiological role and deficiency symptoms of (U)
   a) Nitrogen b) Phosphorous
6. Explain the physiological role and deficiency symptoms of (U)
   a) Sulphur b) Potassium
7. Explain the mechanism of mineral absorption by plants.(U)
8. Schematically represent nitrogen cycle. (S)
9. Explain nitrogen cycle occurring in nature. (U)
10. Explain the steps involved in the conversion of nitrogen in to nitrates.(U)
11. Explain the process of nodule formation in leguminous plants.(U)
12. Draw labelled diagrams of formation of root nodules in leguminous plants.(S)
13. With suitable reactions explain how nitrogen is reduced to ammonia by the enzyme Nitrogenase. (U)
14. Explain how ammonia is used up in the production of amino acids in plants.(U)
15. Explain amino acid biosynthesis in plants.(U)

CHAPTER 13: PHOTOSYNTHESIS IN HIGHER PLANTS

ONE MARK QUESTIONS:

1. Define Photosynthesis. (K)
2. Which is the ultimate source of energy for all living organisms? (K)
3. Who provided the evidence to show that glucose is produced when plants grow?(K)
4. Where are the photosynthetic pigments located?(K)
5. Which is the hydrogen donor to reduce co_2 in green plants?(K)
6. Which is the hydrogen donor to reduce co_2 in purple and green sulphur bacteria?(K)
7. Who showed that the o_2 evolved by the green plants comes from water and not from co_2?(K)
8. Give the equation that represents the overall process of photosynthesis.(K)
9. Which is the site of photosynthesis in green plants?(K)
10. The chloroplasts align themselves along the walls of mesophyll cells. Why?(K)
11. Expand the abbreviation ATP(K)
12. Expand the abbreviation NADP(K)
13. Where does the light reaction of photosynthesis occur?(K)
14. Where does the dark reaction of photosynthesis occur?(K)
15. What is the membrane system of chloroplast called?(K)
16. Name the fluid filled region of chloroplast?(K)
17. Which is the chief photosynthetic pigment in higher plants?(K)
18. Give the wavelength of light at which maximum photosynthesis occurs. (K)
19. What do you mean by accessory pigments?(K)
20. Expand the abbreviation LHC(K)
21. Why the reaction centre of PSI is called P-700?(K)
22. Why the reaction centre of PS-II is called P-680?(K)
23. What is a reaction centre?(K)
24. What are antenna molecules?(K)
25. What are cytochromes?(K)
26. Which is the source of electrons for P-680of PS-II in the Z scheme of electron transport?(K)
27. What is a proton gradient?(K)
28. Which is the primary co_2 acceptor in dark reaction?(K)
29. Why calvin cycle is also called c_3-pathway?(K)
30. Which is the first stable compound produced in calvin cycle?(K)
31. How many CO_2 molecules are required to make one molecule of glucose through Calvin cycle? (K)
32. Expand the abbreviation PGA(K)
33. Name the key enzyme at co_2 reduction in calvin cycle.(K)
34. Expand the abbreviation RuBisCo. (K)
35. What is the type of anatomy found in the leaves of c_4 plants?(K)
36. What is the first stable compound in c_4 pathway?(K)
37. Why Hatch-slack pathway is also called c_4 pathway?(K)
38. Which is the primary carbon di oxide acceptor in c_4 pathway?(K)
39. By looking at which internal structure of a plant, one can tell whether it is c_3 or c_4 plant?(K)
40. What is photorespiration?(K)
41. Where do you find RuBisCo in the c_4 plants?(K)
42. Where does C_3 cycle occur in C_4 plants? (K)
43. State the Blackman's law of limiting factor (K)

44. How to identify c_4 plant?(K)
45. Name the enzyme responsible for carboxylation of PEP during C_4 cycle. (K)
46. Tomatoes and Bell peppers yield better when grown in greenhouses. Why?(A)
47. Engelmann in his experiment used *Cladophora*-a green alga and aerobic bacteria .What is the use of bacteria in the experiment? (U)
48. What are pigments?(K)
49. Which process helps in replacing the electrons removed from PSI to PSII?(U)
50. Name a simple procedure used to separate leaf pigments. (K)

TWO MARKS QUESTIONS:

1. Explain an experiment to show that photosynthesis takes place only in green parts of the plant.(U)
2. Draw a labelled diagram of a chloroplast. (S)
3. Mention the two main steps of photosynthesis. (K)
4. Mention the names of photosynthesis pigments. (K)
5. What is a photosystem? Mention its components(K)
6. Draw a neat labelled diagram of light harvesting complex. (S)
7. What is light harvesting complex? (K)
8. Explain how oxygen is evolved by splitting of water. (U)
9. Why ATP and NADPH are called reducting powers. (K)
10. Explain why non cyclic photophosphorylation (z-scheme) occurs only in grana lamellae but not in stroma lamellae. (U)
11. Only ATP molecules are produced in cyclic phosphorylation, but not NADPH. Why?(A)
12. What are the requirements for chemiosmosis to occur?(K)
13. Mention the end products of light reaction. (K)
14. Even though dark reaction is not light dependent, it is indirectly dependent on the light. Discuss(A)
15. RuBisCo is an enzyme that acts both as carboxylase and oxygenase. Justify(A)
16. How many molecules of ATP and NADPH are required to produce one molecule of Glucose? (K)
17. Name the two different carboxylase enzymes involved in c_4 pathway.(K)
18. RuBisCo has affinity towards both co_2 and o_2.Discuss (A)
19. Mention the internal factors that influence the rate of photosynthesis. (K)
20. Mention the external factors that influence the rate of photosynthesis. (K)
21. Photosynthesis is important for two reasons. What are they?
22. Name the hydrogen donor of green plants and purple and green sulphur bacteria. (K)
23. Most of the photosynthesis takes place in the blue and the red regions of the spectrum, however some photosynthesis does take place at other wavelengths of the visible spectrum. Explain(U)
24. List the events of photochemical phase. (K)
25. Write differences between PSI and PSII(U).
26. What is phosphorylation? Where does it take place?(K)
27. Write the functions of F_0 and F_1 of the ATPase enzyme. (K)

THREE MARKS QUESTIONS:

1. Explain half leaf experiment to show the necessity of $c0_2$ for photosynthesis(U)
2. During Priestley's experiment , when he kept only the mouse and the burning candle, mouse died and candle extinguished after sometime. why? (A)

3. During Priestly's experiment , whe he kept a mint plant with the mouse and the burning candle ,mouse stayed alive and the candle continued to burn.Why?(A)
4. Explain the experiment of Jon Ingenhousz to show to liberation of oxygen during photosynthesis(U)
5. Explain the experiment of T.W Engelmann to show that plants absorb blue and red light for photosynthesis(U)
6. Explain the necessity of presence of pigments other than chlorophyll-a even though they are not directly involved in the light reaction (A)
7. During Chemiosmotic method of ATP synthesis along with the protons released from water , additional protons from the matrix are transported to the lumen of the thylakoids.Dicuss (A)
8. Explain "KRANZ" anatomy found in the leaves of c_4 plants(U)
9. Photorespiration doesnot occur in c4 plants .why?(K)
10. Photorespiration occurs only in c_3 plants but not in c_4 plants.why?(K)
11. C_4 plants shows chloroplast dimorphism .Discuss(A)
12. Productivity of c_4 plants is more than c_3 plants. How? (K)
13. Even though only few mesophyll cells involve in bio synthetic calvin pathway among c_4 plants they are more productive.Discuss (A)
14. Suppose a plant has high concentrations of chlorophyll-b, xanthophylls and carotenoids. It lack chlorophyll-a, can it carry out photosynthesis. Then why do the plants have these pigments?
15. List the events of 'Z' scheme(K)
16. Name the two parts of ATPase enzyme. What are their roles?(U)
17. The possible location of cyclic photophosphorylation is stroma lamellae. Justify with reasons.(U)

FIVE MARKS QUESTIONS:

1. Explain the bell jar experiment of Priestly to demonstrate the role of air in growth of green plants(U)
2. Explain the Z scheme of light reaction(U)
3. Give the schematic representation of the Z scheme(S)
4. Explain the non cyclic photophosphorylation(U)
5. Explain the cyclic photophosphorylation(U)
6. Mention the differences between cyclic and non cyclic photophosphorylations(U)
7. Explain the chemiosmotic hypothesis of ATP-synthesis(U)
8. Give the schematic representation to show ATP –synthesis through chemiosmosis.(S)
9. What is a proton gradient? How is it formed between the lumen of the thylakoid and stroma of the chloroplast?(U)
10. Give the schematic representation of calvin cycle or Give the schematic representation of c_3 cycle (S)
11. Explain Calvin cycle or c_3 cycle(U)
12. Give the schematic representation of c_4 pathway or hatch-slack pathway (S)
13. Explain c_4 pathway or Hatch-slack pathway of co_2 reduction(U)
14. In c_4 pathway carboxylation occurs twice .Discuss(A)
15. The c_3 pathway occurs in the bundle sheath cells of c_4 plants but not in the mesophyll cells.Discuss(A)
16. Explain the differences between $c_3$and c_4 plants(U)
17. C_4 plants are more efficient photosynthetically than c_3 plants-Justify (A)
18. Explain the Blackman's law of limiting factor by taking the example of light as one of the factor (U)
19. Explain the factors influencing the rate of photosynthesis(U)
20. Calvin pathway occurs in all the mesophyll cells of c_3 plants. In the c_4 plants, it does not take place in the mesophyll plants but only in the bundle sheath cells. Justify (U)

CHAPTER 14: RESPIRATION IN PLANTS

ONE MARK QUESTIONS:

1. What is cellular respiration? (K)
2. Where do cellular respiration takes place?(K)
3. What are respiratory substrates?(K)
4. Name the most common respiratory substrate.(K)
5. Why ATP is called 'energy currency of the cell'?(K)
6. Define glycolysis.(K)
7. Where does glycolysis occur in the cell?(K)
8. Name the key product of glycolysis.(K)
9. Define fermentation.(K)
10. What is alcoholic fermentation?(K)
11. What is lactic acid fermentation?(K)
12. Define aerobic respiration.(K)
13. Mention the site of aerobic respiration in the cell.(K)
14. Why Kreb's cycle is called Tricarboxylic acid cycle? (U)
15. Name the first compound formed during Kreb's cycle.(K)
16. What is substrate level phosphorylation?(K)
17. Which is the first product of the TCA cycle?(K)
18. What is an Electron transport system?(K)
19. Name the location of ETS. (K)
20. Name the final hydrogen acceptor in ETS.(K)
21. What is oxidative phosphorylation?
22. Why respiratory pathway is called amphibolic pathway?(K)
23. What is respiratory quotient?(K)
24. What is the significance of stepwise release of energy in respiration.(K)
25. "Not all cells of the green plants produce their own food". Justify
26. What is respiration?
27. Name the process which partially oxidise glucose without the help of oxygen.(K)
28. What is EMP pathway?(K)
29. What is the function of invertase?(K)
30. Name the enzyme which helps in phosphorylation of glucose and fructose.(K)
31. Kreb's cycle is also called aerobic respiration. Why?(U)
32. What is the process by which organisms can carry out complete oxidation of glucose and extract the energy and stored to synthesize large number of ATP?(K)

TWO MARKS QUESTIONS:

1. Name the respiratory substrates other than glucose.(K)
2. Name the organs used for gaseous exchange in plants.(K)
3. Write the overall chemical equation of cellular respiration.(K)
4. Mention two steps of glycolysis where ATP is utilized.(K)
5. List the two types of fermentation.(K)
6. Differentiate alcoholic fermentation from lactic acid fermentation. (U)
7. Distinguish between fermentation and aerobic respiration.(U)

8. Differentiate glycolysis from Kreb's cycle.(U)
9. Differentiate respiration from combustion.(U)
10. What are respiratory substrates? Name the most common respiratory substrate. (K)
11. List two steps of glycolysis where ATP is synthesised. (K)
12. Write a note on alcoholic fermentation.(U)
13. Write a note on lactic acid fermentation.(U)
14. Mention the crucial events/steps of aerobic respiration. (K)
15. Mention the different components of ETS. (K)
16. What is respiratory quotient? Write RQ value for fats. (K)
17. What is respiratory quotient? Write RQ value for Carbohydrates. (K)
18. Distinguish between herbivores and carnivores.(U)
19. Name the structures of plants which help in gaseous exchange.(K)
20. Write function of F_1 head piece and F_0 factors in ATP synthesis.(K)

THREE MARKS QUESTIONS:

1. Plants can get along without respiratory organs. Substantiate the statement with three valid reasons. (A)
2. Write a note on oxidation decarboxylation of pyruvate in mitochondria. (K)
3. What are the main steps in aerobic respiration? (K)
4. Write a note on fermentation.(U)
5. Write a note on ATP synthase of ETS(U)
6. Draw a diagram to show ATP synthetase in mitochondria.(S)
7. What are the assumptions during the calculation of net gain of ATP? (K)
8. Distinguish between aerobic respiration and anaerobic respiration.(U)
9. Distinguish glycolysis from fermentation.(U)
10. Distinguish glycolysis from citric acid cycle.(U)
11. Distinguish between fermentation and aerobic respiration. (U)
12. Based on need what are the three pathways that decide metabolic fate of pyruvate? (K)
13. Name the three enzymes which catalyse alcoholic fermentation. (K)

FIVE MARKS QUESTIONS:

1. Give the schematic representation of glycolysis. (S)
2. Explain the steps of glycolysis. (S)
3. Give the schematic representation of overall view of Kreb's cycle. (S)
4. Describe ETS.(U)
5. Discuss 'the respiratory pathway is an amphibolic pathway'.(U)
6. Briefly explain the events of Kreb's cycle.(U)
7. Explain the steps where ATP and $NADH+H^+$ synthesis takes place during glycolysis.(U)
8. Give schematic representation of tricarboxylic acid cycle.(S)
9. Write the schematic representation Electron Transport System.(S)

CHAPTER 15: PLANT GROWTH AND DEVELOPMENT

ONE MARK QUESTIONS:

1. Which is the most fundamental and conspicuous characteristic of a living being? (K)
2. Define growth. (K)
3. "Plants retain the capacity for unlimited growth throughout their life". Why? (U)
4. What is open form of growth? (K)
5. "The growth in plants is called open form of growth". Give reason. (A)
6. Define primary growth in plants. (K)
7. Define secondary growth in plants. (K)
8. Define growth rate. (K)
9. Write the mathematical expression of an arithmetic growth? (K)
10. Write the mathematical expression of geometric growth. (K)
11. Name the curve obtained in arithmetic growth. (K)
12. Name the curve obtained in geometric growth. (K)
13. "A sigmoid curve is the characteristic of living organisms growing in a natural environment". Give reason. (A)
14. What is efficiency index? (K)
15. "Plant growth and development is intimately linked with water status of the plant". Give reason. (A)
16. Define differentiation. (K)
17. Define dedifferentiation. (K)
18. Define redifferentiation. (K)
19. What is development? (K)
20. Define plasticity? (K)
21. Define determinate growth. (K)
22. Define meristem (K)
23. Define indeterminate growth. (K)
24. Define absolute growth rate. (K)
25. Define relative growth rate. (K)
26. Define phytohormones. (K)
27. What are plant growth promoters? (K)
28. What are plant growth inhibitors? (K)
29. Who discovered Auxins? (K)
30. Who discovered the Gibberellins? (K)
31. Name the disease of rice seedling caused by *Gibberella fujikuroi*. (K)
32. Name the pathogen responsible for 'bakane" (foolish seedling) disease. (K)
33. What is callus? (K)
34. Expand the abbreviation ABA. (K)
35. Who discovered kinetin (cytokinins)? (K)
36. Name the gaseous growth regulator of plants. (K)
37. Who discovered Ethylene? (K)
38. Expand the abbreviation IAA. (K)
39. Expand the abbreviation IBA. (K)
40. Name any one synthetic Auxin. (K)
41. Define apical dominance. (K)
42. Expand NAA. (K)
43. Expand 2,4-D. (K)

44. Name the synthetic auxin which is widely used as a herbicide (K)
45. What is bolting? (K)
46. Name the hormone responsible for bolting in plants. (K)
47. Name the hormone which helps to overcome apical dominance. (K)
48. Name the gaseous PGR synthesised in large amount by tissues undergoing senescence and ripening of fruits. (K)
49. Name the mostly widely used PGR in agriculture. (K)
50. Name the most widely used compound as a source of Ethylene (K)
51. Why ABA is called stress hormone? (K)
52. What are long day plants? (K)
53. What are short day plants? (K)
54. What are day neutral plants? (K)
55. What is photoperiodism?
56. Define vernalization.
57. Defoliated plant would not respond to photoperiodic cycle. Why? (U)
58. What induced parthenocarpy in grapes? (K)
59. Name the hormone responsible for seed dormancy. (K)
60. What happens if a rotting orange is kept with unripen bananas. (U)
61. Name the natural cytokinin present in coconut milk and corn kernels. (K)
62. Name the PGR used to initiate rooting in stem cuttings. (K)
63. What would be expected to happen if GA3 is applied to rice seedlings? (U)
64. Which plant growth regulator would you use if you are asked to quickly ripen the fruits? (K)
65. With reference to geometrical growth $W_1=W_0e^{rt}$, what does 'r' signify?(U)
66. Give an example of plant growth regulator which is the derivative of adenine.(K)
67. Give an example of plant growth regulator which is the derivative of carotenoids.(K)
68. Name the plant from which auxin was isolated.(K)
69. Which hormone is called stress hormone?(K)
70. Which hormone is called ripening hormone?(K)
71. Application of 2,4-D on crops like paddy is not affected, though a weedicide. Why?(A)
72. 2,4-D is used in gardens to maintain weed free lawns. Justify (A)
73. Name the hormone which helps in producing more yield of sugar.(A)
74. What is naturally occurring cytokinin called?(K)
75. How does cytokinin help in delaying senescence? (U)
76. Which plant hormone exists in gaseous form?(K)
77. What is ethephon?(K)

TWO MARKS QUESTIONS:

1. Name two auxins obtained from plants.(K)
2. Name any two synthetic auxins.(K)
3. Differentiate between determinate and indeterminate growth. (U)
4. Name the meristematic tissue responsible for primary growth and secondary growth. (K)
5. Mention the parameters used to measure the growth in plants. Give an example. (K)
6. Write the characteristics of cells in the meristematic phase of growth. (K)
7. List the characteristics of cells of elongation phase of growth in plants. (U)
8. Draw the graphical representation of arithmetic growth in plants. (S)
9. Draw the graphical representation of geometrical growth in plants. (S)

10. Explain the terms:
a) Absolute growth rate
b) Relative growth rate (K)
11. Write a note on conditions required for growth. (U)
12. Distinguish between differentiation and dedifferentiation. (U)
13. Differentiate differentiation from redifferentiation. (U)
14. Differentiate dedifferentiation from redifferentiation. (U)
15. Define plasticity. Give two examples. (K)
16. Which are the two types of plant growth regulators? (K)
17. What are plant growth promoters? Give an example. (K)
18. What are plant growth inhibitors? Give an example. (K)
19. Mention any two groups of plant growth regulators with growth promoting properties. (K)
20. Name two plant growth regulators with growth inhibiting property. (K)
21. Differentiate absolute growth rate from relative growth rate. (U)
22. Name two synthetic auxins used in agricultural and horticultural practice. (K)
23. Name two natural auxins isolated from plants. (K)
24. List any four horticultural applications of auxins. (U)
25. What is apical dominance? Mention the hormone responsible for it. (K)
26. What is bolting? Mention the hormone which induces bolting. (K)
27. Mention any four physiological effects of gibbereliins. (K)
28. List any four physiological effects of cytokinins. (U)
29. Name two hormones which promote abscission. (K)
30. What is respiratory climactic? Name the hormone responsible for this phenomenon. (K)
31. Define seed dormancy. Name the plant growth regulator which causes seed dormancy. (K)
32. Write any four applications of Ethylene. (K)
33. Mention the extrinsic factors which control plant growth and development. (K)
34. “Both growth and differentiation in higher plants are open” – Comment. (U)
35. What do you understand by photoperiodism and vernalization? (K)
36. List any two physiological effects of abscisic acid. (U)
37. Differentiate long day plants from short day plants. (U)
38. Differentiate long day plants from day neutral plants. (U)
39. Differentiate between short day plants from day neutral plants. (U)
40. Write a note one discovery of auxins. (U)
41. Write a note on discovery of gibberellins. (U)
42. Write a note on discovery of cytokinins. (U)
43. Explain inhibitory effects of auxins with help of an example. (U)
44. What will you do to prevent leaf fall and fruit drop in plants? Support you answer with reason.(U)
45. How does ABA acts as an antagonist to Gibberellic acid? (U)
46. What is senescence? What are its causes? (K)
47. In most plants the terminal bud suppresses the development of lateral buds. What is this phenomenon called? Name the plant growth regulator that can promote this phenomenon. (K)
48. What are biennials? Give two examples.(K)
49. Abscisic acid is a stress hormone. Substantiate giving two reasons.(A)
50. What is naturally occurring cytokinin called? Name the substance from which it is obtained.(K)
51. Which are the two processes of development?(K)
52. Differentiation in plants is open. Justify (A)
53. Explain plasticity in Larkspur and Buttercup plants. (U)
54. Name two subtypes of factors which constitute intrinsic factors that help in development.(K)

THREE MARKS QUESTIONS:

1. Describe the different phases of growth in plants. (U)
2. Briefly discuss the arithmetic growth along with its mathematical expression. (U)
3. Briefly describe the geometrical growth. (U)
4. Write a note on different conditions required for growth in plants.
5. Define the following terms:

a) Differentiation
b) Dedifferentiation
c) Redifferentiation

6. Write the schematic representation showing sequence of developmental process in a plant cell. (S)
7. Explain plasticity with two examples. (U)
8. List the characteristics of plant growth regulators. (U)
9. Classify the plants on the basis of requirement of light for flowering (photoperiodism). (U)
10. Write a note on vernalization. (U)
11. Which are of the plant growth regulators will you be using, if you are asked to
    a) Quickly ripen a fruit
    b) Induce rooting in a twig
    c) Delay leaf senescence (U)
12. Both short day plant and long day plant can produce flower simultaneously in given place. Explain. (U)
13. Write a note on abscisic acid. (U)
14. Mention any two causes of seed dormancy. Mention its significance. (K)
15. List any six physiological functions of auxins. (U)
16. List any six physiological functions of gibberellins. (U)
17. List any six physiological functions of cytokinins. (U)
18. List any six physiological functions of Ethylene. (U)
19. What would be expected to happen if

a) Gibberellic acid is applied to rice seedling
b) Dividing cells stop differentiating
c) You forget to add cytokinin to culture medium. (A)

20. Shoot apices which modify into flowers by themselves cannot perceive photoperiods. Then how does photoperiodism affects flowering?(U)
21. Winter crop plants should be planted in autumn. Why ?(A)

FIVE MARKS QUESTIONS:

1. Explain the arithmetic growth along with its graphical representation. (U)
2. Draw the sigmoid (S) curve showing geometric growth. Explain the different phases of geometric growth. (U)
3. List five main groups of natural plant growth regulators.
4. Write a note on discovery, physiological functions & agricultural/horticultural applications of auxins. (U)
5. Write a note on discovery, physiological functions and agricultural/horticultural applications of gibberellins. (U)
6. Write a note on discovery, physiological functions and agricultural/horticultural applications of cytokinins. (U)
7. Write a note on discovery, physiological functions and agricultural/horticultural applications of ethylene. (U)

8. Write a note on discovery, physiological functions and agricultural/horticultural applications of abscisic acid. (U)
9. What is photoperiodism ? What is its significance? (U)
10. What is vernalization? What is its significance? (U)
11. Discuss the practical applications of growth regulators. (U)
12. Write a note on long day, short day and day neutral plants. (U)
13. List the physiological functions of Ethylene. (U)
14. List the physiological functions of cytokinins. (U)
15. Discuss briefly the role of light and temperature on initiation of flowering. (U)
16. Match the fallowing hormones with their discoverers.(K)

1.	Auxins	a. E. Kurosava
2.	Cytokinins	b. F. Skoog
3.	Gibberellins	c. F.T.Addicott
4.	Ethylene	d. F.W.Went
5.	Abscisic acid	e. Cousins

UNIT 5: HUMAN PHYSIOLOGY

CHAPTER 16: DIGESTION AND ABSORPTION

ONE MARK QUESTIONS:

1. Define digestion. (k)
2. Define the term *'thecodont.'* (k)
3. Name the hardest chewing surface of human teeth. (k)
4. How many incisors are present in the oral cavity? (k)
5. How many canines are present in the oral cavity? (k)
6. How many premolars are present in the oral cavity? (k)
7. How many molars are present in the oral cavity? (k)
8. Write the dental formula of human beings (k)
9. Name the salivary gland present in the cheek region. (k)
10. Name the salivary gland present below the tongue. (k)
11. Which salivary gland is found in the lower jaw? (k)
12. Where do you find *frenulum*? (k)
13. Where do you find *papillae*? (k)
14. What is the name of the small projections on upper surface of the tongue? (k)
15. What is the role of *epiglottis*? (k)
16. Mention the function of Goblet cells. (k)
17. What percentage of starch is hydrolysed by amylase in the oral cavity? (k)
18. Give another name for *intestinal juice*. (k)
19. Name the cells which secrete HCL. (k)
20. Other than salivary gland, which gland secretes amylase? (u)
21. Name the only enzyme which helps in activating *proenzymes*. (k)
22. Name the pancreatic enzyme which acts on starch. (k)
23. Define *peristalsis*. (k)
24. Name the major lymph vessel present in the *intestinal villi*. (k)
25. Name the duct which carries bile juice and pancreatic juice into the duodenum. (k)
26. What is the function of gallbladder? (k)
27. Name the duct of gallbladder. (k)
28. Where do you find crypts of *Lieberkühn?*(k)
29. Define *deglutition*. (k)
30. What is *bolus?* (k)
31. What is the role of salivary amylase in the digestive system? (k)
32. What role does lysozyme play in the salivary juice? (k)
33. In which region of the digestive system do you find symbiotic microorganisms? (u)
34. Name the gland which secretes *succus entericus?* (k)
35. Name the hormone which is associated with the disease *diabetes mellitus*. (u)
36. What is the function of pyloric sphincter? (k)
37. Name the sphincter present at the junction of oesophagus and stomach. (k)
38. Which vestigial organ is found associated with the human digestive system. (k)
39. Where do you find Sphincter of Oddi? (k)
40. Name the digestive enzyme present in salivary juice? (k)
41. Which is the antibacterial agent present in the saliva? (k)
42. What is chyme? (k)

43. What is the function of enterokinase? (k)
44. Where is ileo-caecal valve located? (k)
45. What are micelles? (k)
46. What are chylomicrons? (k)
47. Define assimilation. (k)
48. What is the function of villi present in the small intestine? (u)
49. Name the connective tissue sheath covering the hepatic lobules. (k)
50. Which region of the brain controls the reflex of vomiting? (k)
51. How does HCL help in protein digestion? (u)
52. What is the range of pH found in stomach? (k)
53. How is the gastric mucosa protected from HCL? (u)
54. Pancreas secretes insulin. Which is the other hormone secreted by pancreas? (u)
55. What is the role of intrinsic factor secreted by oxyntic cells? (u)
56. What is the other name of parietal cells? (k)
57. Name the duct of gall bladder. (k)
58. Why is emulsification important for digestion? (u)
59. Which gland secretes the enzyme nuclease? (k)
60. What is the role of Brunner's gland in the digestive system? (u)
61. Which is the outermost layer of the wall of the alimentary canal? (k)
62. In what range of pH does digestion take place in small intestine? (u)
63. Name the duct which carries bile juice and pancreatic juice into the duodenum. (k)
64. Name the proteolytic enzyme which helps in the digestion of milk in infants. (k)
65. Where do you find Brunner's gland? (k)
66. Which is the shortest segment of the small intestine? (k)
67. Define absorption with respect to the digestive system. (k)
68. Where do you find goblet cells? (k)
69. Name the end product of protein digestion. (k)
70. Name the cells which secrete pepsinogen. (k)
71. Define defecation. (k)
72. Name the enzyme which helps in the digestion of nucleotides. (k)
73. What is the function of gall bladder? (u)
74. Which component of bile juice causes emulsification? (k)
75. What is lacteal? (k)
76. Which is the largest gland in the human body? (k)
77. Which is the innermost layer of the wall of the alimentary canal? (k)
78. In which layer of the alimentary canal wall do you find loose connective tissue? (k)
79. What are rugae? (k)
80. Give the approximate weight of liver in the human body. (k)
81. Name the sphincter which guards the hepatopancreatic duct. (k)
82. Name the sphincter which controls passage of food from the oesophagus into the stomach. (k)
83. How many permanent teeth does an adult human have? (k)
84. Name the structure which regulates the opening of the oesophagus into the stomach. (k)
85. Name the structure which guards the opening of the stomach to the duodenum. (k)
86. What is Glisson's capsule? (k)
87. Mention any one end product of lipid digestion? (k)
88. Name the exocrine secretion of the pancreas. (k)
89. What is the function of Maltase? (u)
90. What is the function of Lactase? (u)

91. What is the function of sucrase? (u)
92. What is the function of Dipeptidase? (u)
93. What is the function of pepsin? (u)
94. What is the function of rennin? (u)
95. What is the function of trypsin? (u)
96. What is the function of chymotrypsin? (u)
97. What is the function of carboxypeptidase? (u)
98. What is the function of pancreatic amylase? (u)
99. What disease is caused by consuming spicy food and overeating? (k)
100. What is jaundice? (k)
101. If a person consumes alcohol, which part of the digestive system absorbs it? (k)
102. Name the 'U' shaped structure emerging from the stomach. (k)
103. Which is the small blind sac present in the digestive system of human being? (k)
104. What is the opening of the wind pipe called as? (k)
105. Name the cartilaginous flap which covers the glottis. (k)
106. In which part of the alimentary canal does absorption of water, simple sugars and alcohol takes place? (k)
107. Name the enzymes involved in the breakdown of nucleotides into sugars and bases.(k)
108. What do we call the type of teeth attachment to jaw bones in which each tooth is embedded in a socket of jaw bones? (k)
109. Define assimilation with respect to the digestion. (k)

TWO MARKS QUESTIONS:

110. Where do you find Glisson's capsule? Mention the function of Glisson's capsule.(k)
111. Mention the parts of the small intestine? Name the glands present in the small intestine. (k)
112. Explain the term Diphyodont. (u)
113. Name any two major components of food. (k)
114. Why is water essential for our body? (u)
115. Differentiate between bolus and chyme. (u)
116. Name the four layers of the wall of the alimentary canal. (k)
117. Explain the steps involved in fat digestion. (u)
118. What is the role of pepsin and rennin in the digestive system? (k)
119. Mention the regions of absorption of the following compounds in the digestive system: (a) Drugs, (b) amino acids (c) glucose (d) Fructose. (k)
120. Mention the regions of absorption of the following compounds in the digestive system: (a) fatty acids (b) alcohol (c) Water (d) Drugs (k)
121. Name any four parasites which can infect the intestine. (k)
122. What is the composition of succus entericus? (k)
123. Where is the stomach located in the human body? Mention the major parts of the stomach. (k)
124. Without emulsification the process of digestion is incomplete. Explain. (u)
125. Explain how facilitated transportation helps in the process of digestion. (u)
126. Explain the process of digestion in the oral cavity. (u)
127. Draw a neat labelled diagram of the villi of small intestine. (s)
128. Bile juice and enterokinase are essential for digestion. Give reasons. (a)
129. Explain the functions of large intestine. (u)

THREE MARKS QUESTIONS:

130. Name the salivary glands found in the human being and mention their location. (k)
131. What is the composition of saliva? (k)
132. Name the major digestive glands in the digestive system of man. (k)
133. Briefly explain the process of digestion in the oral cavity. (u)
134. Mention the parts of the large intestine. (k)
135. What are the major types of cells found in the glands of stomach and mention its secretions. (k)
136. What is the role of HCL in the stomach? (u)
137. Name the Inactive enzymes found in the stomach and pancreatic juice. (k)
138. What is the composition of bile juice? (k)
139. What are the functions of bile juice? (k)
140. Name the different types of teeth and their number in an adult human being. (k)
141. Explain the action of pancreatic juice on proteins. (u)
142. Describe the process of lipid digestion in man. (u)
143. Briefly explain the process of absorption of fatty acids and glycerol in the digestive system. (u)
144. What are the functions of liver? (k)
145. How does butter in your food get digested and absorbed in the body? (u)
146. How are the activities of the gastro-intestinal tract regulated? (u)
147. Distinguish between constipation and indigestion. Mention their major causes. (u)
148. List the end products obtained after complete digestion of food. (k)
149. Bile juice contains no digestive enzymes, yet it is important for digestion. Why?

FIVE MARKS QUESTIONS:

150. Draw a neat labelled diagram of digestive system of a human being. (s)
151. Name the associated exocrine glands of the digestive system. Mention their location. (k)
152. Explain the mechanism of protein digestion in humans. (u)
153. Explain the mechanism of carbohydrate digestion in humans. (u)
154. Draw a neat labelled diagram of a section of small intestine and describe its structure. (s)
155. Draw neat labelled diagram of the duct system in liver, gallbladder and pancreas. (s)
156. Write a brief note on the permanent teeth in an adult human being. (k)
157. Draw a neat labelled diagram of a section of villi and explain its structure and function. (s)
158. Explain the process of digestion in the stomach. (u)
159. How are polysaccharides and disaccharides digested in our body? (u)
160. Write a brief note on the following diseases of the digestive system: (a) Jaundice (b) vomiting (c) diarrhoea (d) constipation and (e) indigestion. (k)
161. Define absorption. How and where does absorption of the following take place? (a)Amino acids and monosaccharides, (b)Fatty acids and glycerol (u)
162. Explain the process of absorption of digested food in the stomach and small intestine. (u)

CHAPTER 17: BREATHING AND EXCHANGE OF GASES

ONE MARK QUESTIONS:

1. Define breathing. (k)
2. Name the organ of respiration in Earthworm. (k)
3. Name the organ of respiration in insects. (k)
4. Name the organ of respiration in aquatic arthropods. (k)
5. Name the organ of respiration in molluscs. (k)
6. Name the organ of respiration in fishes. (k)
7. Which part of the human respiratory system is common to both food and air? (k)
8. In which part of the human respiratory system is the glottis located? (k)
9. Why is larynx called sound box? (u)
10. In which region of the thoracic vertebrate does the trachea divide into right and left pulmonary bronchi? (u)
11. Which part of the respiratory system is referred as the conducting part of the respiratory system? (k)
12. Name the instrument used to measure the volume of respiration? (k)
13. What is the protective membrane of the lungs called? (k)
14. Name the primary site of exchange of gases in our body. (k)
15. Which is the respiratory or exchange part of the respiratory system? (k)
16. Name the dome shaped muscles found below the lungs which help in breathing. (k)
17. On an average how many times does a healthy human being breathe in a minute? (u)
18. How is the volume of air involved in breathing movements measured? (k)
19. Define tidal volume. (k)
20. What is the tidal volume in a healthy human being? (k)
21. Define inspiratory reserve volume. (k)
22. What is residual volume in a normal human being? (k)
23. Define Inspiratory capacity. (k)
24. What is the expiratory reserve volume in a human being? (k)
25. Define residual volume. (k)
26. State the volume of air that remains in the lungs after expiration. (k)
27. What is the residual volume in an average human being? (k)
28. How is inspiratory capacity calculated? (u)
29. How is expiratory capacity calculated? (u)
30. Define functional residual capacity. (k)
31. What is vital capacity? (k)
32. What is total lung capacity? (k)
33. Which is the primary site for exchange of respiratory gases? (k)
34. What is the partial pressure of oxygen in atmospheric air? (k)
35. What is the partial pressure of oxygen in alveoli? (k)
36. What is the partial pressure of oxygen in deoxygenated blood? (k)
37. What is the partial pressure of oxygen in oxygenated blood? (k)
38. What is the partial pressure of Oxygen in tissues? (k)
39. What is the partial pressure of carbon dioxide in atmospheric air? (k)
40. What is the partial pressure of carbon dioxide in alveoli? (k)
41. What is the partial pressure of carbon dioxide in the oxygenated blood? (k)
42. What is the partial pressure of carbon dioxide in deoxygenated blood? (k)
43. What is the partial pressure of carbon dioxide in the tissues?

44. What is the percentage of oxygen that is transported by RBC in blood? (k)
45. 97% of oxygen is transported by RBC in blood. How is the remaining 3% of oxygen carried? (u)
46. What is the percentage of carbon dioxide that is transported by RBC? (k)
47. What percentage of carbon dioxide is transported by blood in the form of Bicarbonate? (k)
48. Which pigment carries oxygen in blood? (k)
49. How many molecules of oxygen does a haemoglobin molecule carry? (k)
50. Define oxygen dissociation curve? (k)
51. How much of oxygen can be delivered to the tissues by 100 ml. of oxygenated blood under normal physiological conditions? (u)
52. Which enzyme helps in the transportation of carbon dioxide in our blood? (k)
53. How much of carbon dioxide can be delivered by 100 ml. of donated blood to the alveoli? (u)
54. In which component of blood do you find the enzyme carbonic anhydrase? (u)
55. In what form is 70% of carbon dioxide transported? (u)
56. Name the enzyme which catalyses the diffusion of carbon dioxide into RBC. (k)
57. Name the muscles which separate the thorax and abdomen. (k)
58. What do you call haemoglobin which carries carbon dioxide? (k)
59. Which region of the brain moderates the functions of the respiratory rhythm centre? (k)
60. Name the specialised centre in the medulla region of the brain which is responsible for regulation of respiration. (k)
61. What is Asthma? (k)
62. What is Emphysema? (k)
63. What is the major cause of Emphysema? (k)
64. How does cigarette smoking cause emphysema? (u)
65. Why is respiration in insects called direct? (u)
66. Why is exposure to carbon monoxide harmful to animals? (u)

TWO MARKS QUESTIONS:

67. Describe the structure of the diffusion membrane of alveoli. (u)
68. Give two examples of lower invertebrates, which breathe through simple diffusion. (k)
69. What is the use of oxygen dissociation curve? (k)
70. Which are the two stages of breathing? (k)
71. What are the factors which enable the binding of oxygen to haemoglobin?
72. Name two centres of our brain which regulates respiration. (k)
73. Mention any two disorders of the respiratory system. (k)
74. Write a brief note on asthma. (u)
75. Write a brief note on emphysema. (u)
76. Workers in certain industries involve in grinding and stone breaking. Why should they wear protective masks? (a)
77. Distinguish between IRV and ERV. (u)
78. Distinguish between vital capacity and total lung capacity. (u)
79. Define vital capacity. What is its significance? (u)
80. What are the major layers of the diffusion membrane? (k)
81. Define total lung capacity. How is it calculated? (u)
82. Which fluid filled membrane covers the lungs? What are its major functions? (u)
83. Name the organs of respiration in the following organisms: (a) Insects (b) Birds. (k)
84. Draw a neat labelled diagram of the oxygen dissociation curve. (s)
85. What is the importance of the conducting part of the respiratory system? (u)

86. Mention the factors which affect the rate of diffusion in the alveoli. (k)
87. What are the four functions of the conducting part of the respiratory system? (k)
88. What happens when:(a) Partial pressure of Carbon dioxide is increased? (b) Partial pressure of Oxygen is decreased?
89. Name the important parts involved in creating a pressure gradient between lungs and the atmosphere during normal respiration. (k)
90. Differentiate between Emphysema and occupational respiratory disorder.(u)

THREE MARKS QUESTIONS:

91. Explain the different parts of the respiratory tract in human beings. (u)
92. Define respiration. Mention the steps involved in respiration. (k)
93. Name the organs of respiration in the following animals: (a) Earthworm, (b) insects and (c) fish. (k)
94. Explain the role of muscles in the mechanism of breathing. (u)
95. Draw a neat labelled diagram of a section of alveolus with the pulmonary capillary. (s)
96. How is respiration regulated in the human body? (u)
97. Discuss the oxygen dissociation curve and the factors which help in the transport of oxygen. (a)
98. Explain how carbonic anhydrase helps in respiration. (u)
99. Discuss the variation in percentage of oxygen and carbon dioxide transported through plasma and haemoglobin. (a)
100. Explain the following respiratory volumes: (a) Inspiratory reserve volume (b) Expiratory reserve volume and (c) residual volume. (u)
101. Briefly describe the role of neural system in regulation of respiration.
102. What are the factors that affect the rate of diffusion between the blood and tissues? (U)
103. State the different modes of carbon dioxide transport in blood. (K)

FIVE MARKS QUESTIONS:

104. Draw a neat labelled diagram of the respiratory system of human being. (s)
105. List the five steps in respiration in a human being. (k)
106. Describe in brief the respiratory organs of man. (u)
107. Explain the mechanism of breathing in human being with neat labelled sketches. (u)
108. Explain how oxygen is transported from lungs to the tissues in human beings. (u)
109. Explain how carbon dioxide is transported from tissues to the lungs in human beings. (u)
110. What are pulmonary capacities? Discuss and give their approximate volumes. (a)
111. Explain the transport of oxygen and carbon dioxide between alveoli and tissues with a neat labelled diagram. (u)
112. Explain the role of neural system in regulation of respiration. (u)

CHAPTER 18: BODY FLUIDS AND CIRCULATION

ONE MARK QUESTIONS:

1. Which organ is called “graveyard of RBCs”? (K)
2. What is blood?(K)
3. What is plasma?(K)
4. Name the plasma protein responsible for blood clotting (K)
5. Which plasma protein is involved in defense mechanism?(K)
6. Name the plasma protein that maintains osmotic balance in human body (K)
7. What is serum?(K)
8. Name the most abundant of all cells in the blood.(K)
9. Name the enucleated cells of blood. (K)
10. What is haemoglobin? (K)
11. Name the pigment that imparts red color to the blood.(K)
12. What is the life span of human RBC? (K)
13. What are erythrocytes?(K)
14. What are Leucocytes?(K)
15. Name the abundant granulocytes in human blood.(K)
16. Name the granulocytes that are least found in blood. (K)
17. What is the function of platelets?(K)
18. Name the blood component involved in blood clotting. (K)
19. Which blood group is known as universal donor?(K)
20. Name the universal recipient blood group (K)
21. What is the measure adopted to avoid erythroblastosis foetalis?(A)
22. Name the enzyme involved in blood coagulation (K)
23. What is thrombokinase?(K)
24. Who discovered Circulation of Blood for the first time?
25. What is joint diastole?
26. What is lymph?(K)
27. What is open circulatory system?(K)
28. What is closed circulatory system?(K)
29. Closed circulatory system is advantageous over Open circulatory system. Give reason (U)
30. Circulation in fishes is said to be Single circulation. Justify(A)
31. What does SAN generate?(K)
32. Name the blood pumping organ in human body?(K)
33. Mention the function of human heart. (K)
34. Name the site of RBC formation in human body. (K)
35. What Is pericardium?(K)
36. Name the protective layer that invests the human heart.(K)
37. What is interauricular septum?(K)
38. Name the septa present between right auricle and left auricle.(K)
39. What is interventricular septum?(K)
40. Name the septa present between right ventricle and left ventricle.(K)
41. What is tricuspid valve?(K)
42. Name the valve present between the right auricle and right ventricle (K)
43. What is mitral valve?(K)
44. Name the valve present between left atria and left ventricle. (K)

45. What are chordae tendinae?(K)
46. Expand the abbreviation SAN (K)
47. Expand abbreviation AVN (K)
48. Sino Atrial Node is known as the pacemaker of the heart. Justify(A)
49. Define diastole. (K)
50. What is systole?(K)
51. Define stroke volume. (K)
52. What is cardiac output?(K)
53. Write a mathematical expression for cardiac output.(A)
54. Name the instrument used to hear heart beat.(K)
55. Expand abbreviation ECG (K)
56. What are veins?(K)
57. What are arteries?(K)
58. What is pulmonary circulation?(K)
59. What is systemic circulation?(K)
60. Human heart is called myogenic. Give reason(U)
61. What is the normal blood pressure of a healthy normal individual?(K)
62. Expand abbreviation CAD.(K)
63. Name the severe pain felt in the chest of individual prior to heart attack.(K)
64. What is hypertension?(K)
65. Name the Leucocytes that secrete histamine, serotonin and heparin.(K)
66. What are eosinophils?(K)
67. Mention the function of eosinophils.(K)
68. How can you avoid erythroblastosis foetalis?(K)
69. Name the chemical ion involved in blood clotting phenomenon.(K)
70. What is interstitial fluid or tissue fluid?(K)
71. What is normal RBC count in an adult man?(K)
72. What is normal Haemoglobin count in an adult man?(?(K)
73. What is the average heart beat rate in man? (K)
74. What is the number of cardiac cycles occurring per minute in human heart?(K)
75. What does the P-wave represent in the electrocardiograph?(K)
76. What does the QRS-complex represent in the electrocardiograph?(K)
77. What does the T-wave represent in the electrocardiograph? (K)
78. ECG of an individual is of great clinical significance. Justify.(K)
79. Name the nervous system that moderates cardiac function.(K)
80. Name the nerves that accelerate the heart beat rate.(K)
81. Name the nerves that decrease the heart beat rate.(K)
82. What is atherosclerosis?(K)
83. What is the reason for angina pectoris?(U)
84. What is heart failure?(K)
85. Heart failure is also as called congestive heart failure. Give reason.(E)
86. What is the role of fibrinogen?(U)
87. What is the role of Globulins?(U)
88. What is the role of Albumins?(U)
89. Name the disease associated with Rh -ve factor(K)
90. Name the cells of the bone marrow which produces thrombocytes. (K)
91. Define cardiac cycle. (K)
92. What causes the first heart sound lub? (K)

93. What causes the second heart sound dub?(K)
94. Name the smallest blood vessels.
95. Name the largest artery.
96. Name the largest vein.

TWO MARKS QUESTIONS:

1. Name the circulatory fluids in human body. (K)
2. Name the types of Leucocytes in human blood. (K)
3. What are the blood group types in humans?(K)
4. List the functions of Lymph. (K)
5. Name the chambers of the heart. (K)
6. Explain coronary circulation.(U)
7. Normal BP is represented as 120/80 mm of Hg. What do the numbers represent?(A)
8. Name the types of blood groups in man.(K)
9. What is the basis for blood grouping in man? (K)
10. State the composition of plasma of blood.(K)
11. Name the phagocytic cells of the human blood.(K)
12. Mention any two secretions of Basophils involved in inflammatory reactions.(U)
13. List any two differences between antigen and antibody.(U)
14. What is myogenic heart? Give one example. (K)
15. Name the components of conduction system of the heart.(U)
16. What is double circulation? Mention its significance. (U)
17. What is hypertension? Mention the effects of hypertension. (U)
18. Name the types of circulatory systems in organisms.(K)
19. Differentiate open circulatory system and closed circulatory system.(U)
20. Draw a labeled diagram of a standard electrocardiograph.(S)
21. Describe the waves of the electrocardiograph.(U)
22. Describe systemic circulation.(U)
23. Name the organs connected by the hepatic portal system.(K)
24. Name the nerves that regulate the functions of the heart.(K)
25. Explain coronary artery disease.(U)
26. Describe angina pectoris.(U)
27. Explain heart failure.(U)
28. Why do you call blood circulation in frogs as incomplete double circulation? (U)
29. Why is blood considered as a connective tissue?(U)
30. Differentiate between Diastole & Systole. (U)
31. Differentiate between heart sounds. (U)
32. Differentiate between cardiac arrest and Heart attack. (U)

THREE MARKS QUESTIONS:

1. Name the formed elements of blood. (K)
2. Name the types of granulocytes. (K)
3. Explain erythroblastosis foetalis. (U)
4. Describe the phenomenon of blood coagulation. (U)
5. Write a note on Electrocardiograph. (U)

6. Name the types of blood circulation. (K)
7. Name the major proteins of blood plasma. (K)
8. Name any three disorders of the circulatory system.(K)
9. Write the symptoms of CAD(coronary artery diseases)(K)
10. Write the symptoms of 'Angina pectoris'. (K)
11. Write the symptoms of Heart failure. (K)
12. Write the symptoms of Hyper tension. (K)
13. How to distinguish between Basophill, monocyte and neutrophils. (U)
14. With respect to cardiac activity explain the role of a)ANS b)parasympathetic Signals c)Hormones (U)

FIVE MARKS QUESTIONS:

1. Draw a neat-labeled diagram of the V S of human heart. (S)
2. With a neat-labeled diagram explain the structure of human heart. (S)
3. Describe the conduction system of the heart. (U)
4. Explain the types of blood circulation in man.(U)
5. What is double circulation? Describe with reference to human heart.(U)
6. Explain the blood clotting mechanism in human beings. (U)
7. Explain the ABO blood grouping of human blood. (U)
8. Draw a labeled diagram of the blood circulation in man.(S)
9. Draw a standard ECG and explain the different segments in it. (S)
10. Explain different types of blood groups and donor compatibility by making a table.(U)
11. Explain the events of a Cardiac cycle. (U)
12. Explain the function of Lymph. (U)

CHAPTER 19: EXCRETORY PRODUCTS AND THEIR ELIMINATION

ONE MARK QUESTIONS

1. Which cells Secrete renin? (K)
2. Name the most toxic form of nitrogenous waste produced by animals.(K)
3. Name the least toxic form of nitrogenous waste produced by animals. (K)
4. What is ammonotelism?(K)
5. What is ureotelism?(K)
6. What is uricotelism?(K)
7. Mention the chief nitrogenous waste that is excreted by mammals.(K)
8. Give one example for ammonotelic organism.(U)
9. Give one example for ureotelic organism.(U)
10. Give one example for uricotelic organism.(U)
11. Most aquatic organisms are ammonotelic. Give reason (U)
12. Heparin is added to the blood in the dialysis unit. Why?(A)
13. What is the principle behind excretion of urea and uric acid by mammals and reptiles respectively? (K)
14. Name the organ of mammals that converts ammonia into urea.(K)
15. Name the excretory organ in vertebrates.(K)
16. What are the excretory organs in phylum Platyhelminthes?(K)
17. What is protonephridia?(K)
18. Name the osmoregulatory organs in Platyhelminthes. (K)
19. What is the function of protonephridia in Platyhelminthes?(U)
20. What are Malpighian tubules?(K)
21. Name the excretory organs of cockroach. (K)
22. Name the excretory organs in crustaceans. (K)
23. What are green glands? (K)
24. Name the human excretory organs. (K)
25. What are the conical masses present in the medulla of human kidney?(K)
26. What are nephrons?(K)
27. Name the structural and functional units of human excretory system.(K)
28. Where is 'Columns of Bertini' located? (K)
29. What are Bowman's capsules? (K)
30 Expand the abbreviation PCT.(U)
31. Expand abbreviation DCT.(U)
32. What is Henle's loop?(K)
33. What are cortical nephrons?(K)
34. What are juxta medullary nephrons?(K)
35. What are peritubular capillaries?(K)
36. What is Vasa recta? (K)
37. Glomerular filtration is called ultrafiltration. Give reason.(U)
38. Define ultrafiltration/ glomerular filtration.(K)
39. Name the epithelial cells lining the Bowman's capsule. (K)
40. What are podocytes?(K)
41. What is glomerular filtration rate?(K)
42. State the function of PCT.(U)
43. Name the part of the nephron that maintains high osmolarity of medullary interstitial fluid.(K)
44. Name the part of the nephron that maintains sodium potassium balance in blood.(K)

45. What is counter current mechanism?(K)
46. Expand abbreviation ADH.(U)
47. Name the anti diuretic hormone.(K)
48. State the function of ADH.(U)
49. Name the vasoconstrictor that increases GFR.(K)
50. Expand abbreviation GFR.(U)
51. Mention the role of Angiotensin I. (K)
52. Mention the role of Angiotensin II. (K)
52. Which hormone activates the release of Aldosterone?(K)
53. Which hormone regulates the reabsorption of water in the kidneys? (K)
54. Which hormone regulates the reabsorption of salts in the kidneys?(K)
55. Expand abbreviation ANF (U)
56. What is micturition?(K)
59. Which organ of the human body is involved in the release of CO_2 from human body?(U)
60. State the role of sebaceous glands in excretion (U)
61. Mention one excretory function of the liver. (K)
62. What is Uremia?(K)
63. What is haemodialysis?(K)
64. What method is employed to remove urea from blood when an individual suffers from renal failure?(A)
65. Give one example for an anticoagulant of blood.(U)
66. What is the anticoagulant used in haemodialysis?(K)
67. What is renal calculi?(K)
68. Name the kidney stones.(K)
69. What is glomerulonephritis?(K)
70. What do you call the inflammation of glomerulus?(U)
71. What are Osmoreceptors?(K)
72. Name the enzyme released by the juxtamedullary apparatus.(K)
73. What is the pH of urine?(K)
74. What is the disease called when an individual suffers from glycosuria and ketonuria?(K)
75. What is the primary function of sweat?(K)
76. In an analysis urine has the presence of glucose and ketones, What does it indicate(A)
77. What are nephridia?(K)
78. Heparin is added to the blood in a dialyzing unit. Why? (U)
79. Which part of peritubular structure is absent in cortical nephrons?(K)
80. What is the amount of blood filtered by kidneys per minute?(K)
81. What is GFR per day?(K)
82. Name the hormone synthesized by JGA when GFR falls down. (K)
83. The primary filtrate becomes very concentrated as it moves down the henle's loop. Why?(A)
84. What is glycosuria? (K)
85. What is ketonuria? (K)
86. What is the amount of urea excreted by a normal healthy adult per day? (K)
87. Name the excretory organs of earthworm and annelids. (K)

TWO MARKS QUESTIONS:

1. Name four metabolic wastes produced by organisms.(K)
2. Define excretion. Mention any two nitrogenous wastes produced during metabolism.(K)
3. What are ammonotelic organisms? Mention two examples.(K)

4. What are ureotelic organisms? Mention two examples.(K)
5. What are uricotelic organisms? Mention two examples.(K)
6. Name the type of excretory waste produced in (K)
    a) Bony fishes b) Marine fishes c) adult frogs d) Birds
7. Differentiate ammonotelic and ureotelic organisms with one example each.(K)
8. Differentiate ammonotelic and uricotelic organisms with one example each.(K)
9. Differentiate uricotelic and ureotelic organisms with one example each.(K)
10. Mention the excretory organs in (K)
    a) Amphioxus b) Cockroach c) Earthworm 4) Prawn
11. Differentiate cortical nephrons and juxta medullary nephrons(K)
12. Name the layers of endotheliocapsular membrane.(K)
13. Mention the role of juxta medullary apparatus in the regulation of glomerular filtration rate.(U)
14. When is kidney transplanted & why the donor has to be a close relative?
15. How does PCT help in maintaining the ph and ionic balance of body fluids?(U)
16. Mention the role of Henle's loop in urine formation.(U)
17. What is the role of collecting ducts in urine formation?(U)
18. Mention the role of vasopressin in urine formation.(U)
19. What is Atrial Natriuretic Factor (ANF)? How does it check Renin – Angiotensin mechanism?(U)
20. List the role of aldosterone in kidney function.(K)
21. Mention the role of skin in excretion.(K)
22. Draw a labeled diagram of Malpighian body or Renal corpuscle(S)
23. What are the components of Malphighian corpuscle?
24. How is ammonia excreted by ammonotelic organisms?
25. Write the role of Renin?
26. Classify nephrons based on the length of Henle's loop.

THREE MARKS QUESTIONS:

1. Name the types of metabolic wastes produced by organisms.(k)
2. List the steps involved in the mechanism of urine formation.(k)
3. Explain the role of the tubules of the nephron in urine concentration mechanism.(u)
4. Explain haemodialysis.(u)
5. Name and explain any three disorders of the excretory system.(k)
6. Explain the role of Renin – Angiotensin in the regulation of kidney functions.(u)
7. What are sebaceous glands? Write its functions.(u)
8. What are the three layers through which glomerular filtration take place? (K)

FIVE MARKS QUESTIONS:

1. Draw a neat-labeled diagram of human urinary system.(s)
2. Explain the structure of human excretory system with a neat –labeled diagram.(u)
3. Draw and label the parts of the longitudinal section of human kidney.(s)
4. Explain the anatomy of human kidney. (u)
5. With a neat-labeled diagram explain the structure of a nephron. (s)
6. Draw and label the parts of a nephron / uriniferous tubule. (s)
7. Describe the mechanism of urine formation in the nephrons.(u)
8. Explain the functions of nephron tubules in urine formation.(u)
9. Explain the mechanism of concentration of glomerular filterate.(u)

10. Describe the role of different hormones in the regulation of kidney function.(u)
11. Give a brief account of counter-current mechanism. (u)
12. Describe the role of liver, lungs and skin in excretion. (u)
13. Explain the role of Henle's loop and vasa recta in the formation of concentrated urine. (u)

CHAPTER 20: LOCOMOTION AND MOVEMENT

ONE MARK QUESTIONS:

1. Name the movement exhibited by unicellular organisms.(K)
2. Which animal uses tentacles for locomotion.(K)
3. Movement and locomotion cannot be studied separately. Why?(U)
4. Which cells shows amoeboid movements in human?(U)
5. " Tubular organs are lined by cilia" Why?(U)
6. Give an example of muscular movements.(K)
7. "Smooth muscles are involuntary In action" Justify the statement.(A)
8. What is sarcolemma?(K)
9. State the difference between I- Band and A- Band found in striated muscles.(S)
10. What is F- Actin?(K)
11. Mention the site on Myosin by which it forms cross bridge?(U)
12. What is HMM (Heavy Mero Myosin)?(K)
13. What is neuromuscular junction?(K)
14. What is sarcomere?(K)
15. What is the significance of myoglobin?(U)
16. Which muscle fibres are striated but involuntary in action?(U)
17. What are visceral muscles?(K)
18. What is neuromuscular junction?(K)
19. Name the parts of myosin monomer.(U)
20. Name the neurotransmitter released in neuromuscular junction?(K)
21. Define striated muscles. (K)
22. Define visceral muscles. (K)
23. Define smooth muscles. (K)
24. Define cardiac muscles. (K)
25. What is found in the globular head of globulin? (K)
26. What is the collagenous tissue layer which holds muscle bands? (K)
27. Name the neurotransmitter that generates action potential? (K)
28. What is myoglobin? (K)
29. What is sliding filament theory?(K)

TWO MARKS QUESTIONS:

30. How cross bridge will form?(U)
31. Name the bands formed by specific arrangement of proteins. (U)
32. Write the difference between fascicles and fascia.(U)
33. Muscle fibres appear red and pale/ white. Why?(U)
34. Write the complex proteins associated with actin.(U)
35. Sketch and label sarcomere.(S)
36. Add a note on myosin monomer.(U)
37. Draw actin filament and show the location of troponin and tropomyosin.(S)
38. Mention functions of cilia in *Paramecium*.(U)
39. Write the differences between smooth muscles and rough muscles. (U)
40. Compare skeletal muscles with cardiac muscles. (U)

THREE MARKS QUESTIONS:

1. What is movement? With suitable example explain the types of movements.(U)
2. Name the type of movement found in *Amoeba, Paramecium* and limbs of mammals.(K)
3. Explain the arrangement of actin and myosin.(U)
4. With labelled sketch describe the structures of actin and myosin.(S)
5. Draw a diagram showing cross- bridge formation.(S)
6. List three types of muscles based on their location.(K)

FIVE MARKS QUESTIONS:

1. Repeated muscle contraction causes accumulation of lactic acid. Why? What is the effect of it? Specify role of myoglobin. (A)
2. Why some muscles appear white? How they derive energy source?(U)
3. Explain mechanism of voluntary muscle contraction.(S)
4. Depict diagrammatically formation and breaking of cross bridge.(S)
5. What are contractile proteins? Explain its arrangement in rough muscles.(U)
6. Draw neat labelled diagram of sarcomere.(S)
7. What are the following?
   a. Myofibrils b. Fascicles c. Fascia d. Sarcoplasm d. Regulator proteins
8. What are the different types of movements exhibited by the cells of human body?

SKELETAL SYSTEM

ONE MARK QUESTIONS:

1. What is skeletal system?(K)
2. Name the parts of skeletal system.(U)
3. How many bones are present in human skeleton.(K)
4. Name the major divisions of human skeleton.(U)
5. What is sternum?(U)
6. What are floating ribs?(K)
7. How many bones are found in each limb of man?(K)
8. What is patella?(K)
9. What is collar bone?(K)
10. What is pubic symphysis?(K)
11. What is atlas?(K)
12. Which girdle articulates with the forelimbs?(U)
13. What are synovial joints?(U)
14. Where do we find fibrous joints?(K)
15. Which joints are found between the vertebrae.(K)
16. Which disorder is characterised by the accumulation of uric acid?(U)
17. Which disorder is caused due to autoimmunity?(K)
18. Name the genetic disorder of muscles.(U)
19. What is osteoporosis?(K)
20. What do you “Rapid spasm in muscles”? (K)

21. How many bones are there in facial region? (K)
22. Name the ‘ U’ shaped bone present at the base of buccal cavity. (K)
23. How many cranial bones are there?
24. How many vertebrae are found?
25. Name the first vertebra.
26. How many pairs of ribs are present?
27. Which ribs are called true ribs?
28. How many bones form a limb?

TWO MARKS QUESTIONS:

1. Draw and label vertebral column.(S)
2. What is appendicular skeleton? Name the parts.(K)
3. What is skull? Name it parts.(K)

THREE MARK QUESTIONS:

4. Name the bones of middle ear.(K)
5. Name the bones forming pelvic girdle (K).
6. List the three types of ribs.(K)
7. Enlist the types of vertebrae?
8. Explain significance of joints.(U)
9. List three types of joints.(K)
10. Enlist the parts of pectoral girdle. (K)

FIVE MARK QUESTIONS:

1. What is skeletal system? Write two divisions of skeletal system.(U)
2. What is rib cage? List the parts of it.(U)
3. Enlist the synovial joints and write the location of each joint.(U)
4. Explain the cause and symptoms of tetany, Arthritis and gout.(U)
5. What is i. Acromian ii. Glenoid iii. Scapula iv. Sternum v. Hyoid (K)
6. Enlist the bones forming forelimb.(K)
7. Enlist the bones forming hind limb.(K)
8. Name the type of joint between the following(A)

    a. Atlas and Axis
    b. Between phalanges
    c. Femur and acetabulum
    d. Pubic bone and pelvic girdle
    e. Between cranial bones

CHAPTER 21: NEURAL CONTROL AND COORDINATION

ONE MARK QUESTIONS:

1. Name the structural and functional unit of nervous system.(K)
2. Define coordination.(K)
3. What is synaptic knob? (K)
4. What are neurotransmitters?(U)
5. What is the role of Schwann cells? (U)
6. Name the gap between the adjacent myelin sheath.(K)
7. What is resting potential? (U)
8. Name the duct which passes through midbrain. (K)
9. What is corpora qudrigemina?(U)
10. Where are Nissl's granules located?(U)
11. What is Node of Ranvier?(U)
12. Why neurons are called excitable cells?(U)
13. Define synapse.(K)
14. Which is the major portion of human brain? (K)
15. What are Meninges? (K)
16. Name the nerve fibres which connect cerebral hemisphere. (K)
17. What is corpus callosum?(K)
18. What are cerebral hemispheres? (U)
19. What are association neurons? (U)
20. Name the centre for sensory signaling.(U)
21. You suddenly withdraw body from extreme hot. What is this called-?(U)
22. What is limbic system?(K)
23. Name the canal present between forebrain and hindbrain?(K)
24. What is brain stem?(U)
25. Which is the largest part of the human brain?(K)
26. Name the sockets of the skull in which eyes are located (K)
27. Where do you find carpora quadrigemina?(U)
28. Where is hunger centre located in human brain?(U)
29. Mention the outer layer out of three meninges?(U)
30. Define nerve impulse. (K)
31. Name the protein present in rods.(K)
32. Name the command and control system of human body.(K)
33. Define reflex arc.(U)
34. Which part of the brain maintains body equilibrium?(K)
35. What is retina? (K)
36. What forms iris of the eye?(K)
37. Name the aperture surrounded by the iris. (U)
38. Name the cells of Retina?(K)
39. What do you call anterior portion of the sclera ? (K)
40. What are photoreceptor cells?(K)
41. Name the vitamin required for the formation of rhodopsin.(K)
42. What is blind spot?(U)
43. Name the opaque and pigmented structure of eye.(K)

44. What is the function of ossicles in middle ear?(K)
45. What is the function of Eustachian tube?(U)
46. Name auditory receptors?(K)
47. Name the receptors responsible for maintenance of balance of the body and posture?(U)
48. Where do you find bipolar neurons?(K)
49. Define reflex action?(K)
50. Which cells of retina enable us to see colored objects?(U)
51. Name the exposed, transparent part of the eyeball?(U)
52. What is labrynth? (K)
53. Name the gland present in the ear canal?(K)
54. What are neurotransmitters?(K)
55. Which part of the ear determines the pitch of a sound? (K)
56. Which kind of neuron is found in embryonic stage? (K)
57. What forms the brain stem? (U)
58. What is Eustachian tube? (U)
59. What are the fibres that transmit impulse towards cell body? (U)
60. Name the neural system which transmit impulses from the CNS to the involuntary organs and smooth muscles of the body. (U)
61. Name the neural system which transmits impulses from the CNS to skeletal system. (U)

TWO MARKS QUESTIONS:

1. Differentiate between afferent and efferent nerve fibres.(U)
2. Name the systems which coordinates and integrate all the activities in human body.(K)
3. List the divisions of PNS.(K)
4. List the divisions of ANS. (K)
5. Mention the two parts of neural system in human.(K)
6. Differentiate between myelinated and nonmyelinated neuron. (U)
7. How synapse is formed? (U)
8. Name two types synapse.(K)
9. Why cerebral cortex appears grey? (U)
10. What is reflex action?(K)
11. Which are the photoreceptor cells found in retina? (K)
12. What is photopic and scotopic vision? (A)
13. Write the differences between aqueous humour and vitreous humour. (U)
14. Which are photosensitive pigments present in human eye? (K)
15. Write a short note on organ of corti. (U)
16. Name the parts of otolith organ. (K)
17. Add a note on internal ear. (U)
18. Differentiate between grey and white matter.(U)
19. Differentiate cranial nerves and spinal nerves. (U)
20. What is somatic nervous system? Give one example.(A)
21. Mention any 4 functions of cerebrum.(U)
22. Explain the three types of ear ossicles. (U)
23. Mention the components of reflex arc.(A)
24. Write any four differences between cones and rods.(U)
25. Compare resting potential and action potential. (S)

THREE MARKS QUESTIONS:

1. Name the three cranial meninges. (K)
2. List the functions of neurons.(U)
3. Classify neurons based on number of axon and dendrites.(K)
4. What are parts of CNS? Mention its function. (U)
5. Mention the parts of neuron.(K)
6. Based on the number of axon and dendrites neurons are classified into three types.List the types.(U)
7. Explain polarised state of neural membrane.(A)
8. Add a note on electrical synapse. (A)
9. Explain the mechanism of reflex action. (U)
10. Enlist three parts of human brain.(K)
11. Enlist three functional areas of cerebral cortex. (U)
12. Explain the functions of association areas. (U)
13. List the parts forming hindbrain.(K)
14. Secretions for digestion, heart rate, breathing rate are controlled by medulla. Why?(A)
15. Which are the three layers forming wall of eye ball? (U)
16. Explain the structure of cerebrum.(U)
17. Enlist the cells present in retina.(U)
18. Which colours are identified by cones? (U)
19. Name the region of retina where photoreceptor cells are absent?(U)
20. Name the ear ossicles present in the middle ear. (K)
21. Draw sectional view of cochlea and label the parts.(S)
22. Explain chemical synapses.(U)
23. Draw neat labeled diagram of V.S of human eye.(S)

FIVE MARKS QUESTIONS:

1. Draw a neat labeled diagram of sagital section of human brain.(S)
2. Illustrate the development of neural system from lower invertebrates to chordates.(A)
3. With suitable example plan the reflex pathway. (A)
4. Draw a neat labeled diagram of ear.(S)
5. Explain the structure of human eye.(S)
6. Draw and label multipolar myelinated neuron.(S)
7. Explain selective permeability of neural membrane. (A)
8. Explain the mechanism of conduction of nerve impulse.(U)
9. Sketch and label axon terminal and synapse.(S)
10. Explain the chemical impulse transmission through synapse.(U)
11. List various functions of human brain.(K)
12. Describe the functions of hypothalamus. (A)
13. Draw sagittal section of human brain and label the parts.(S)
14. Explain in brief mechanism of hearing. (A)

15. What is
    a. Corpus callosum
    b. Cerebral aqueduct
    c. Sclera
    d. Labrynth
    e. Blind spot
16. Explain the role of Na^+ in the generation of action potential. (A)
17. Explain mechanism of generation of light- induced impulse in the retina.(A)

CHAPTER 22: CHEMICAL COORDINATION AND INTEGRATION

ONE MARK QUESTIONS:

1. Define hormone.(K)
2. Mention the name of the neurosecretory cells ,which secrete the hormone in the hypothalamus.(K)
3. Which of the endocrine gland is regulated by hormones from hypothalamus?(K)
4. What are glucocorticoids?(U)
5. Which hormone inhibits the release of growth hormone from pituitary?(K)
6. Where is hypothalamus located?(K)
7. Why vasopressin is called antidiuretic hormone?(U)
8. Which of the hormone regulates the 24hour diurnal rhythm?(K)
9. What is isthmus?(K)
10. Mention one function of thyrocalcitonin.(U)
11. Mention the location of thymus gland.(K)
12. Name the endocrine gland functional till adolescence and degenerates in adult.(U)
13. Where in the body adrenal glands are located.(K)?
14. Mention the types of cells in the testis which produce testosterone.(K)
15. Name the hormone secreted from the atrial wall of heart.(K)
16. Mention the hormone secreted from corpus luteum.(K)
17. What is the function of secretin?(K)
18. Which hormone stimulates the secretion of bile juice from gall bladder?(U)
19. To which chemical group do testosterones and estrogens belong?(U)
20. Mention the function of erythropoietin.(U)
21. Name the hormone produced by pars intermedia. (k)
22. What causes gigantism?(k)
23. What happens when growth hormone over secreted?(k)
24. What happens when GH is secreted low? (K)
25. Which hormone regulates secretion of androgens?(k)
26. Name the hormone responsible for regulation and pigmentation of skin.(k)
27. Which gland secrete melatonin?(k)
28. What is T_3? (k)
29. What is T_4? (k)
30. If the menstrual cycle is irregular in a woman, what is the cause.(U)
31. Which hormone helps in bone resorption?(U)
32. Which is the main glucocorticoid in our body? (k)
33. Which is the main mineralocorticoid in our body? (k)

TWO MARKS QUESTIONS:

1. Mention two types of hormones secreted by hypothalamus regulating the secretion of pituitary based on their mode of action.(U)
2. Distinguish between endocrine and exocrine gland.(U)
3. Enlist the target organ of hormone MSH and ACTH. (A)
4. Write a note on how the function of anterior pituitary is regulated by a hormone.(A)
5. Mention the two regions of pituitary based on the anatomy.(K)
6. Name the two portions of adenohypophysis.(K)
7. Mention the hormones of neurohypophysis.(K)

8. What is the function of neurohypophysis hormones?(U)
9. Mention the two regulations by melatonin.(A)
10. What are the symptoms seen in the growing baby of hypothyroidism pregnant woman?(A)
11. List the functions of thyroid hormone.(U)
12. Parathyroid hormone is called hypercalcemic hormone. Justify.(S)
13. Write a short note on functions of thymosin.(U)
14. Name two types of tissues in adrenal gland.(K)
15. Mention two hormones secreted from adrenal medulla.(U)
16. Write a note on functions of aldosterone.(U)
17. Mention the hormones secreted from : α cells and β cells of islets of Langerhans(K)
18. Write the difference between insulin and glucagon.(S)
19. Distinguish between hypoglycaemia and hyper glycaemia.(S)
20. What is TCT? What is its function? (U)
21. Why PTH is considered a hypercalcemic hormone? (U)
22. What are catecholamines? (U)
23. Which hormones are secreted during stress? (K)
24. Which is hyperglycaemic hormone?
25. Why glucagon is called hyperglycaemic hormone?
26. What is CCK? What are its functions?
27. It is essential to include Iodine in our diet. Justify.(A)

THREE MARKS QUESTIONS:

1. Name the disorder caused by the deficiency of the following hormones. (U)
   a. Thyroxine b. Insulin c. Growth hormone
2. Explain hormones of fight and flight.(U)
3. Explain the role of thymosins.(S)
4. Enlist three layers of adrenal cortex.(K)
5. Enlist the functions of corticoids. (U)
6. Explain the role of ovarian hormones. (U)
7. Which hormonal deficiency is responsible for the following
   a. Diabetes mellitus b. Goitre c. Cretinism
8. Write the effects of hypothyroidism in pregnant woman.

FIVE MARKS QUESTIONS:

1. Name the endocrine gland in which the following hormones are synthesized. Write one function for each hormone. (A)
   a. Melatonin b. Glucagon c. Thyrocalcitonin
   d. Progesterone e. Cortisol
2. What is adenohypophysis? List any six hormones secreted from it.(K)
3. Adrenalin and Noradrenalin are called as fight flight hormones .Justify.(A)
4. Mention the type of gland and cell type from which insulin is secreted add a note on its action.(A)
5. Explain the mechanism of protein hormone action with a diagrammatic representation.(S)
6. Explain the mechanism of steroid hormone action with a diagrammatic representation.(S)
7. Explain the role of different endocrine cells present in gastrointestinal tract.(S)
8. Define hormone. Explain four types of hormones based on their chemical nature. (U)
9. Explain the role of ANF secreted by atrial wall.(U)

10. Write the hormone secreted by the following(K)
    a. G-I tract b. Kidney c. Atrium d. Pancreas e. Ovary
11. Write one physiological function of a. LH b. GH c. Oxytocin d. Vassopressin e. TSH (K)
12. Write a note on testis as an endocrine gland.(K)
13. Write a note on ovary as an endocrine gland. (K)

I PUC QUESTION BANK

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