Blow Up Syllabus

I PUC BIOLOGY (36)

	Unit-1 Diversity in the living world : 17Hrs	
	Chapter1- The living world Definition of living organisms, Characteristics of living organisms Diversity in the living world- biodiversity definition Nomenclature, Binomial nomenclature, rules Taxonomic categories Taxonomic hierarchy and concept of species,genus,family,order,class,phylum/division and kingdom Taxonomic hierarchy for man,housefly,mango and wheat Taxonomical aids-herbarium, botanicalgarden,museum,zoological park and key	3 Hrs
	Chapter2- Biological classification Classification of living organisms Five kingdoms of life and basis of five kingdom classification. Salient features and Classification of Monera,Protista and Fungi into major groups, Salient features plantae and animalia Virus, Viroids and Lichens	2 Hrs
	Chapter 3-Plant kingdom Salient feature and classification of plants into major group Algae, Bryophytes, Pteridophytes, Gymnosperms and features of each category and at least two examples of each. Angiosperms Classification up to class, characteristic features and examples. Plant life cycles and alternation of generation	6 Hrs
	Chapter 4-Animal kingdom Basis of classification and salient features of Major non chordate phyla and chordate classes with examples	8 Hrs
	Unit II : Structural organization in plants and animals : 15 Hrs	
	Chapter 5 - Morphology of flowering Plants Morphology and functions of different parts of flowering plants. Root, Stem, leaf, inflorescence, flower, fruit and seed. (modification of root, stem, leaf ,inflorescence types and families to be studied in practical)	5 Hrs
	Chapter 6-Anatomy of flowering plants: Tissues and tissue system, anatomy of root, stem and leaves of dicot and monocot plant (Anatomy of root and stem to be studied in practical)	6 Hrs
	Chapter7- Structural organization in animals Animal tissues, organ and organ systems. Digestive, circulatory, respiratory, nervous and reproductive systems of earth worm cockroach and frog (Note: Gross structure and function of the systems to be studied)	8 Hrs

Unit III : Cell Structure and function : 18 Hrs	
Chapter8- Cell-The unit of life Cell definition, Cell theory and cell as the basic unit of life. Structure of a prokaryotic and eukaryotic cell. Plant cell and animal cell. (brief) **Structure and functions of Cell organelles** cell envelope, cell membrane, cell wall, Mitochondria, golgi complex, endoplasmic reticulum, ribosomes, lysosomes, vacuoles, plastids, microbodies, Cytoskeleton, cilia, flagella, centrioles . Nucleus nuclear membrane, chromatin, nucleolus; Chromosomes-structure, types based on position of centromere	10 Hrs
Chapter9- Biomolecules Definition, types and functions of proteins, carbohydrates, fats, nucleic acids.(excluding molecular structures). Enzymes types, properties, factors affecting enzyme action	5 Hrs
Chapter10- Cell cycle, cell division Cell cycle, Mitosis and meiosis, significance of, and differences between Mitosis and meiosis.	4 Hrs
Unit IV : Plant Physiology : 27 Hrs **Chapter11- Transport in plants** Absorption of water and nutrients. **Cell to cell transport** Diffusion and active transport. **Plant – water relations** Imbibition, water potential, osmosis, plasmolysis. **Long distance transport** Apoplast, symplast, root pressure, transpiration pull. **Transpiration and Guttation** **Uptake of mineral and their translocation** Transport through xylem and phloem.	7 Hrs
Chapter 12- Plants and mineral nutrition. Essential minerals, macro and micronutrients and their role Deficiency symptoms. Mineral toxicity. Elementary idea of Hydroponics as a Method to study mineral nutrition. Nitrogen metabolism Nitrogen cycle, biological nitrogen fixation.	7 Hrs
Chapter13- Photosynthesis Autotrophic nutrition, Priestley s experiment Site of photosynthesis. structure of chloroplast Photosynthetic pigments (Elementary idea). Photochemical and biosynthetic phases of photosynthesis. light reaction Cyclic and non-cyclic photophosphorylation. Chemiosmotic hypothesis. Calvin cycle. **Photorespiration.** Factors affecting photosynthesis.Law of limiting factors.	5 Hrs

	Chapter 14- Plant Respiration Cellular respiration glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic). Respiration balance sheet. Amphibolic pathways. Respiratory quotient of nutrients. **Chapter 15- Plant growth and development** Phases and rate of plant growth. Condition of growth. Differentiation, dedifferentiation and redifferentiation. Sequence of developmental process in a plant cell. Growth regulators-auxin, gibberellin, cytokinin, ethylene, ABA. Photoperiodism, Vernalisation.	5 Hrs 7 Hrs
	Unit V : Human physiology : 28 Hrs **Chapter 16- Digestion and Absorption** - Human alimentary canal and Digestive glands. - Role of digestive enzymes - Digestion, absorption and assimilation of digested food. - Nutritional and digestive disorders Diarrhoea, Indigestion, constipation, vomiting, jaundice. **Chapter 17- Breathing and Respiration** - Respiratory organs in animals. (Recall only) - Human respiratory system. - Mechanism of Breathing and its regulation. - Exchange of gases, transport of gases and regulation of respiration. - Respiratory volumes. - Disorders related to respiration Asthma, Emphysema, Occupational respiratory disorders. **Chapter 18- Body fluids and Circulation** - Composition of blood, Blood groups, Coagulation of blood. - Composition and functions of Lymph. - Human circulatory system. - Structure of human heart and blood vessels. - Cardiac cycle, Cardiac output, ECG. - Double circulation. - Regulation of cardiac activity. - Disorders of circulatory system Hypertension, Coronary artery disease, Angina pectoris, heart failure. **Chapter 19- Excretory products and their elimination** - Modes of excretion Ammonotelism, ureotelism, uricotelism. - Human excretory system-structure and function. - Urine formation, Osmoregulaion. - Regulation of kidney function, Renin-angiotensin, Antinatriuretic factor, ADH and Diabeters insipidus. - Disoders Uraemia, Renal failure, Renal calculi and Nephritis. - Dialysis	4 Hrs 4 Hrs 5 Hrs 4 Hrs

	Chapter 20- Locomotion and Movement - Types of movement ciliary, flagellar, muscular. - Skeletal muscle - contractile proteins and muscle contraction. - Skeletal system to be studied in practical. - Disorders of muscular and skeletal system Myasthenia gravis. Tetany, Muscular dystrophy, Arthritis, Osteoporosis and Gout.	5 Hrs
	Chapter 21- Neural control and coordination. - Human nervous system. Central Nervous system, Peripheral Nervous system and Visceral Nervous system. - Structure of a neuron. - Generation and conduction of nerve impulse. - Reflex action. **Chemical coordination and regulation** - Endocrine glands and hormones. - Human endocrine system Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Thymus, Adrenal, Pancreas, and Gonads. - Hormones of heart, kidney and gastro-intestinal tract. - Role of hormones as messengers and regulators.	6 Hrs 6 Hrs

Design of Question Paper

Class : I PUC

Subject : Biology

Code : 36

Time : 3Hours 15 Minutes*(of which minutes for reading the questions 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

Unit	Chapter No	Description	No of 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

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 marks –short answer(SA1)		8	5	
C	3 marks –short answer(SA2)		8	5	
D	5 marks –long answer(LA)	Sec-I	06	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)
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MODEL QUESTION PAPER

SUBJECT: BIOLOGY (36)

1st year PUC

UNIT NO	UNIT	TEACHING HOURS	KNOWLEDGE				UNDERSTANDING				APPLICATION/ APPRECIATION				EXPRESSION/ SKILL				TOTAL QUESTIONS				MARKS WEIGHTAGE
	1st PUC	120	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	
I	DIVERSITY OF LIVING ORGANISMS	19	1	1	-	1	-	1	-	1	-	-	1	-	-	-	-	-	1	2	1	2	18
II	STRUCTURAL ORGANIZATION IN PLANTS ANIMALS	17	1	-	1	-	1	1	-	-	-	-	1	-	-	-	-	1	2	1	1	1	15
III	CELL STRUCTURE AND FUNCTION	19	1	-	1	1	-	-	-	1	1	-	-	-	-	1	-	-	2	1	1	2	17
IV	PLANT PHYSIOLOGY	31	2	1	-	1	-	-	-	2	-	-	-	1	-	-	1	-	2	1	1	4	27
V	HUMAN PHYSIOLOGY	34	2	1	1	1	1	2	1	-	-	-	1	-	-	-	-	1	2	3	3	2	28
		120	40 % 42 marks				30% 33marks				15 % 15marks				15% 15 marks				10	08	08	11	105

NOTE:

1) The question paper must be prepared based on the individual blue print on the basis of weightage of marks fixed for each chapter.

2) A variation of 1% per objective weightage is allowed. 3) A variation of 1 mark per unit/chapter is allowed. However, the total marks should not exceed 105 marks.

4) At least one question each carrying 1 mark, 2 marks, 3 marks and 5 marks have to be derived from each unit.

5) When a question carrying 5 marks is divided into sub-questions (3+2/2+2+1), the sub-questions have to be derived from the same chapter.

6) When a question carrying 5 marks is divided into sub-questions, the sub-questions have to be derived from different topics of the same chapter.

BLUE PRINT

1ST YEAR PUC -SUBJECT: BIOLOGY (36)

CHAPTER-WISE WEIGHTAGE

UNIT NO	HOURS	CHAPTER	HOURS	MARKS PER UNIT	KNOWLEDGE				UNDERSTANDING				APPLICATION/ APPRECIATION				SKILL				TOTAL				TOTAL MARKS	REMARKS
					1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M		
UNIT I DIVERSITY OF LIVING ORGANISMS																										
I	19	1.LIVING WORLD	3	18	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	4	
		2.BIOLOGICAL CLASSIFICAITON	2		-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	
		3.PLANT KINGDOM	6		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	
		4.ANIMAL KINGDOM	8		-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	7	
UNIT II.STRUCTURAL ORGANIZATION IN PLANTS ANIMALS																										
II	17	5.MORPHOLOGY OF FLOWERING PLANTS	5	15	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	4	
		6.ANATOMY OF FLOWERING PLANTS	4		-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	1	-	4	
		7.STRUCTURAL ORGANISATION IN ANIMALS	8		-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1	-	1	7	
UNIT III.CELL STRUCTURE AND FUNCTION																										
III	19	8.CEE-THE UNIT OF LIFE	10	17	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	1	8	
		9.BIOMOLECULES	5		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	5	
		10.CELL CYCLE AND CELL DIVISION	4		-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1	-	4	
UNIT IV.PLANT PHYSIOLOGY																										
IV	31	11.TRANSPORT IN PLANTS	7	27	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1	6	
		12.MINERAL NUTRITION	7		1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	6	
		13.PHOTOSYNTHESIS IN HIGHER PLANTS	5		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	5	
		14.RESPIRATION IN PLANTS	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	5	
		15.PLANT GROWTH AND DEVELOPMENT	7		-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	5	
UNIT V.HUMAN PHYSIOLOGY																										
V	34	16.DIGESTION AND ABSORPTION	4	28	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	3	
		17.BREATHING AND EXCHANGE OF GASES	4		1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	1	1	-	-	3	
		18.BODY FLUIDS AND CIRCULATION	5		1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1	-	4	
		19.EXCRETARY PRODUCTS AND THEIR ELIMINATION	4		-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	3	
		20.LOCOMOTION AND MOVEMENT	5		-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	4	
		21.NEURAL CONTROL AND CO ORDINATION	6		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	5	
		22.CHEMICAL CORDINATION AND INTEGRATION	6		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	
120		TOTAL	120	105																	10	8	8	11	105	

Page 1

MODEL QUESTION PAPER
SUBJECT: BIOLOGY (36)
1st year PUC

Time: 3 Hours and 15 minutes | Max Marks: 70

GENERAL INSTRUCTIONS:

i) This question paper consists of four parts A, B, C and D .Part D consists of two parts, Section-I and 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: - 10x1=10

1. What is a herbarium?
2. Give an example for palmately compound leaf.
3. Collenchyma is called a simple tissue. Why?
4. What are mesosomes?
5. Mention the significance of meiosis.
6. Define root pressure.
7. Name the oxygen scavenger molecule that protects nitrogenase in nodules.
8. What is emphysema?
9. Which blood group is called universal donor?
10. Why the filtration of blood in Bowman's capsule is referred as ultrafiltration?

PART-B

Answer any FIVE of the following questions in 3-5 sentences each, wherever applicable: 5x2=10

11. Write any four characters of fungi.
12. List any four salient features of phylum coelenterata.
13. Give reasons for the following:
    a) The blood vascular system in cockroach is considered as open type.
    b) The vision in cockroach is referred as mosaic vision.
14. Draw a labeled diagram of section of chloroplast.
15. What is vernalization? Mention any one of its importance.
16. Explain how the exchange of O_2 and CO_2 is achieved between alveoli and deoxygenated blood.
17. Explain the role of Atrial Natriuretic factor in the regulation of kidney function.
18. What is osteoporosis? Mention the common cause that leads to osteoporosis.

PART-C

Answer any FIVE of the following Questions in 40-80 words each, wherever applicable. 5x3=15

19. List the important rules of binomial nomenclature. Write the scientific name of housefly.
20. Define the terms: - i) Monoadelphous condition ii) Apocarpous condition iii) Zygomorphic flower.
21. Write any three anatomical differences between dicot leaf and monocot leaf.
22. Write a note on the G_0 phase of cell cycle.
23. Draw the sigmoid growth curve. Write the formula to express exponential growth.
24. Give a brief account of absorption of fatty acids and glycerol in small intestine.
25. Explain the mechanism of coagulation of blood.
26. Write a note on myosin protein.

PART-D

Section-I

Answer any FOUR of the following questions on 200-250 words each, wherever applicable. **4x5=20**

27. Write the general characters of angiosperms.
28. Differentiate between chordates and non-chordates.
29. Draw a labeled diagram of complete digestive system of frog showing internal organs.
30. List the functions of plasma membrane.
31. Explain how the p^H and concentration of substrate affect enzyme activity with graphical representation.
32. Explain the physical properties of water that govern the transpiration driven ascent of sap. Explain how these properties helps in ascent of sap or transpiration pull and how a "pull" is achieved.

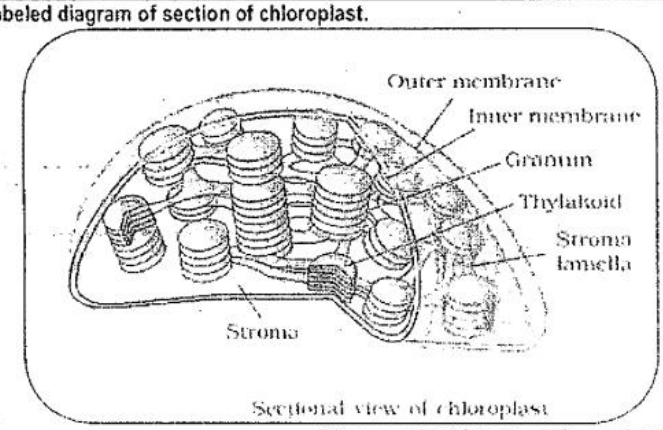
Section-II

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

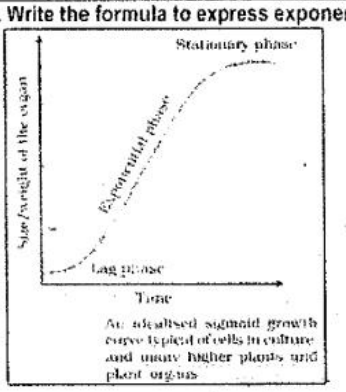
33. What are macronutrients? Describe the roles played by calcium and magnesium in plants.
34. Explain the events of C4 pathway. Mention any two special features of C4 plants.
35. Write the schematic representation of overall view of Citric Acid cycle.
36. Describe the events of reflex action with a diagrammatic representation of knee jerk reflex.
37. What are hormones? Mention one function each for i) ACTH ii) Melatonin iii) Parathyroid hormone iv) Thymosin.

MODEL QUESTION PAPER
SUBJECT: BIOLOGY (36)
1st year PUC
ANSWERS

QUE NO	ANSWERS/VALUE POINTS	MARKS	REFER PAGE NO. (IN THE TEXT BOOK)
	PART-A		
	Answer the following questions in One Word or One Sentence each: -	**10x1=10**	
1	**What is a herbarium?** A herbarium is a store house of collected plant materials, which are dried, pressed and preserved on sheets.	1mark	11-12
2	**Give an example for palmately compound leaf.** Silk Cotton.	1mark	71
3	**Collenchyma is called a simple tissue. Why?** Because, it is made up of single type of cells. **OR** It is a tissue made up of cells that are similar in structure and function.	1mark	86
4	**What are mesosomes?** Mesosomes are the special membranous structures formed by the extension of plasma membrane into the cell in prokaryotes.	1mark	128
5	**Mention the significance of meiosis.** Meiosis helps in conservation of chromosomal number in each species from generation to generation. **OR** Meiosis helps in increasing genetic variability in the population of organisms from one generation to the next generation.	1mark	170 - 171
6	**Define root pressure.** The positive pressure created inside the xylem of the root due to the entry of water when there is a movement of ions into vascular tissues.	1mark	186
7	**Name the oxygen scavenger molecule that protects nitrogenase in nodules.** Leg-haemoglobin.	1mark	203
8	**What is emphysema?** A chronic disorder, in which there is a decrease in the respiratory surface due to the damage of alveolar wall mainly as a result of cigarette smoking.	1mark	275
9	**Which blood group is called universal donor?** "O" blood group.	1mark	280
10	**Why the filtration of blood in Bowman's capsule is referred as ultrafiltration?** Because almost all the constituent of plasma except proteins are filtered into the lumen of the Bowman's capsule due to the presence of small slit in the epithelial layer of Bowman's capsule.	1mark	293
	PART-B		
	Answer any FIVE of the following questions in 3-5 sentences each, wherever applicable:	**5x2=10**	
11	**11. Write any four characters of fungi.** Characters of Fungi: i. They are heterotrophic organisms, either parasitic or saprophytic. ii. They are either unicellular (Eg yeast), or multicellular, filamentous. iii. The body consists of long, slender, thread like structures called hyphae. iv. The network of hyphae is called mycelium. v. Some hyphae of some members are coenocytic (multinucleate). vi. The hyphae may be septate or aseptate. vii. The cell wall is composed of chitin and polysaccharide. viii. Vegetative reproduction occurs by fragmentation, fission and budding.	2	22 - 23

	ix. Asexual reproduction occurs by the production of spores called conidia or sporangiospore or zoospore. x. Sexual reproduction occurs by the production of oospores, ascospores or basidiospores. xi. Sexual cycle involved plasmogamy(fusion of two protoplasts), karyogamy(fusion of two nuclei) and meiosis in zygote resulting in haploid spores. xii. Presence of dikaryotic phase in some members. xiii. Formation of fruiting bodies in which haploid spores are formed after meiosis. **-Any 4 characters- ½mark for each character-2marks**		
12	**12. List any four salient features of phylum Coelenterata.** Salient features of phylum Coelenterata: i. Sessile or free swimming organisms. ii. Presence of Cnidoblasts or cnidocytes that contain nematocytes in tentacles. iii. Presence of Tissue level organization with radially symmetrical, diploblastic body. iv. Presence of gastro vascular cavity. v. Presence of calcareous exoskeleton in corals. vi. Presence of two basic body forms in some members. The body forms are Polyp and Medusa. vii. Polyp produces medusa by asexual reproduction and medusa produces polyp by sexual reproduction. **-Any 4 features- ½mark for each feature-2marks**	2	50 - 51
13	**Give reasons for the following:** **a) The blood vascular system in cockroach is considered as open type.** Because in cockroaches, the blood pumped by heart passes through large vessels into open spaces or large cavities called sinuses OR The blood vessels are poorly developed and open into spaces(haemocoel) **-1mark** **b) The vision of cockroach is referred as mosaic vision.** Because the cockroaches can receive several visions of an object due to the presence of several ommatidia. **-1mark**	2	282/ 113 114
14	**14. Draw a labeled diagram of section of chloroplast.**  Sectional view of chloroplast **Diagram with 4 labeling-½for each labeling-2 marks**	2	136
15	**What is vernalization? Mention its importance.** Exposure of plants to low temperature in order to promote flowering is called vernalization. **-1mark** Subjecting the biennial plants like sugar beet, cabbage, carrot, low temperature to a cold treatment stimulates subsequent flowering. Winter varieties of wheat, barley, rye are planted in autumn so that they overcome winter as small seedlings, resume growth in the spring and harvested in mid-summer. **-Any one importance-1mark**	2	252
16	**Explain how the exchange of O_2 and CO_2 is achieved between alveoli and deoxygenated blood.**	2	272

	Exchange of O_2 and CO_2 between alveoli and deoxygenated blood occurs by simple diffusion based on pressure/concentration gradient. The PO_2 (partial pressure of O_2) in alveoli is 104 mmHg and the PO_2 in deoxygenated blood is 40 mmHg. Due to the difference in partial pressure, the O_2 from Alveoli from diffuses into deoxygenated blood. The PCO_2(partial pressure of PCO_2) in deoxygenated blood is 45 mm Hg and the in alveoli are 40 mm Hg. Due to the difference in partial pressure, the CO_2 from deoxygenated blood diffuses into alveoli.		- 273
17	**Write a note on Atrial Natriuretic Factor in the regulation of kidney function (ANF).** Atrial Natriuretic factor is a peptide hormone secreted by the atrial wall. An increase in the blood flow to the atria of the heart can cause the release of ANF. ANF can cause vasodilation of blood vessels and there by decrease the blood pressure. ANF mechanism acts as a check on the rennin-angiotensin mechanism.	2	297 & 337
18	**What is osteoporosis? Mention the common cause that leads to osteoporosis.** Osteoporosis is an age-related disorder characterized by decreased bone mass and increased chances of fractures. **-1 mark** The most common cause is the decreased levels of estrogen. **-1 mark**	2	312
	PART-C		
	Answer any FIVE of the following Questions in 40-80 words each, wherever applicable.	**5x3=15**	
19	**19. List the important rules of binomial nomenclature. Write the scientific name of housefly.** **Rules of binomial nomenclature:** i. Each scientific name has two components: The first word denoting the **genus** and the second component represents **specific epithet.** ii. Biological names are generally in Latin and written in italics. They are Latinized or derived from Latin. Iii. Both the words in a biological name, when handwritten, are separately underlined or printed in italics to indicate their Latin origin. iv. The first word denoting the genus starts with capital letter while the specific epithet starts with small letter. **- ½mark for each point** **Scientific name of housefly:** *Musca domestica* **-1 mark**	3	7 11
20	**Define the terms:. i) Monoadelphous condition ii) Apocarpous condition iii) Zygomorphic flower.** **i.Monoadelphous condition:** The stamens are united into one bunch or one bundle. **-1 Mark** **ii. Apocarpous condition:** The carpels in a ovary are free/not fused. **-1 Mark** **iii) Zygomorphic flower:** When a flower can be divided into two similar halves only in one particular vertical plane, such flower is referred as zygomorphic flower. **-1 Mark**	3	75 75 72
21	Write any three anatomical differences between dicot leaf and monocot leaf. 1. In dicot leaf, the more stomata are present on the lower (abaxial) epidermis than on the upper (adaxial) epidermis. Whereas in monocot leaf, stomata are present both on upper and lower epidermis almost in equal proportion. 2. In dicot leaf, the mesophyll is differentiated into palisade and spongy parenchyma, whereas in monocot leaf, the mesophyll is not differentiated into palisade and spongy parenchyma. 3. In dicot leaf, bulliform cells are not found, whereas in monocot leaf, bulliform cells are present in the upper epidermis 4. In dicot leaf, the size of vascular bundles vary due to the thickness of veins since it possess reticulate venation. Whereas in the monocot leaf, the parallel venation is reflected in the near similar size of vascular bundles except in main vein. **Any three differences-1 mark for each difference**	3	93 - 94
22	**Write a note on the G_0 phase of cell cycle.**	3	164

	G0 phase: Some cells in the adult animals exit G1 phase and enter an inactive phase called quiescent state or G0 phase of the cell cycle. Cells in this stage remain metabolically active. But these cells do not exhibit cell division, unless called on to do so depending upon the requirement of an organism. Therefore, they divide occasionally, as needed to replace cells that have been lost due to injury or cell death.		
23	**Draw the sigmoid growth curve. Write the formula to express exponential growth.**  An idealised sigmoid growth curve typical of cells in culture and many higher plants and plant organs -2 marks Formula to express exponential growth: $W^t = W0e^{rt}$ -1 mark	3	243
24	**Give a brief account of absorption of fatty acids and glycerol in small intestine.** Fatty acid and glycerol are insoluble, hence cannot be absorbed into the blood. They are first incorporated into small droplets called micelles. Micelles move to intestinal mucosa, where they are reformed into very small protein coated globules called chylomicrons. Chylomicrons are transported into lymph vessels in villi and Lymph vessels release these absorbed substances into blood stream.	3	265
25	**Explain the mechanism of coagulation of blood.** An injury or trauma stimulates the platelets in the blood to release certain factors that activate the coagulation. They activate thrombokinase enzyme. Thrombokinase enzyme converts inactive prothrombin to active thrombin. Thrombin converts inactive fibrinogen to active fibrin. Fibrin forms the clot in the form of a network and Ca++ ions play an important role in clotting.	3	281
26	**Write a note on myosin protein.** Myosin is a polymerized contractile protein present in skeletal muscle. In myosin, many monomeric proteins called meromyosins are present. Each meromyosin has two parts, a globular head with a short arm (heavy meromyosin-HMM) and a tail (Light meromyosin-LMM). The head and short project outwards at regular distance from each other from the surface of a polymerized myosin and it is called cross arm. The globular head is an ATPase enzyme and it has binding site for ATP and active site for action.	3	306
	PART-D ***Section-I*** **Answer any FOUR of the following questions on 200-250 words each, wherever applicable.**	**4x5=20**	
27	**27. Write the general characters of angiosperms.** General characters of angiosperms: i. Angiosperms are flower bearing plants in which pollen grains and ovules are developed in flowers. ii. Seeds are enclosed by fruits. iii. The male sex organ is stamens which contains anthers	5	40 - 41

iv. The female sex organ is pistil that consists of ovary enclosing many ovules.
v. Each embryo sac has 3-celled egg apparatus, one egg cell and two synergids, 3 antipodals and two polar nuclei.
vi. Pollen grains are transferred to the stigma through a process called pollination.
vii. One male gamete fuses with the egg cell to form zygote (syngamy).
viii. Another male gamete fuses with diploid secondary nucleus to form triploid primary endosperm nucleus (Triple fusion). The fusion of two male gametes with the two different components of embryo sac is called double fertilization.
viii. The zygote develops into embryo (with one or two cotyledons).
ix. The primary endosperm nucleus develops into endosperm that provides nourishment to the developing embryo.
x. The ovules develop into seed.
xi. The ovaries develop into fruit.

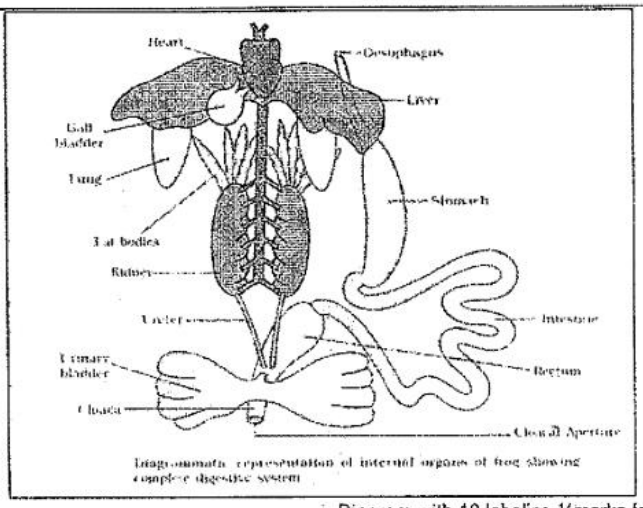
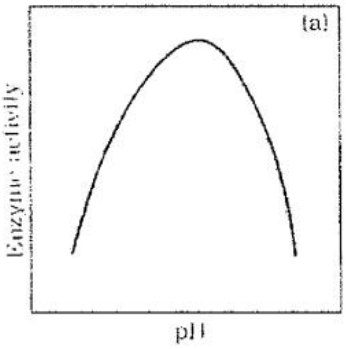
-Any 10 characters-½marks for each character

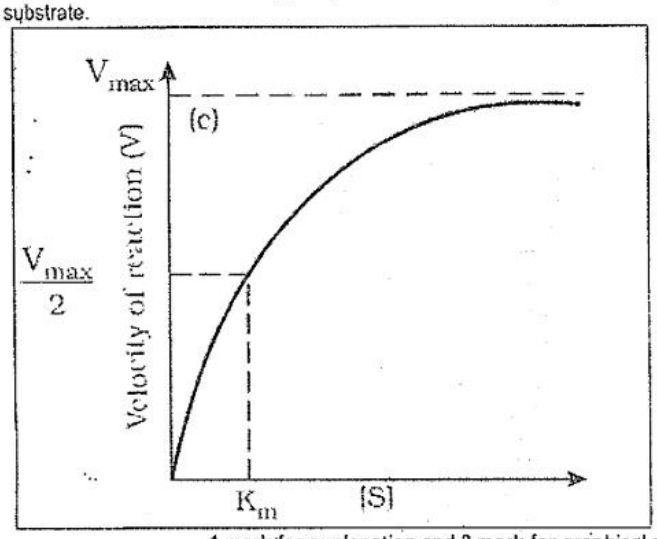
28 **Differentiate between chordates and non-chordates.** 5 55

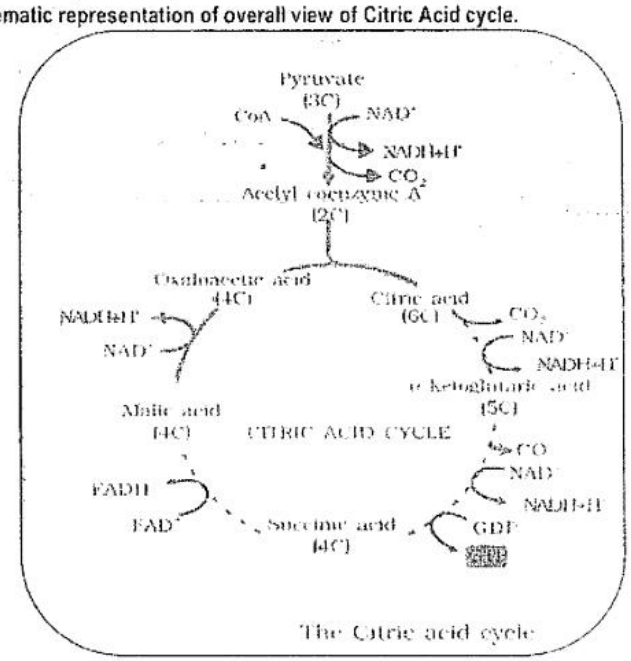
CHORDATES	NON-CHORDATES
1. Notochord is present	1.Notochord is absent
2. Central nervous system is dorsal, hollow and single	2. Central nervous system is ventral, solid and double
3. Pharynx perforated by gill slits.	3. Gill slits are present.
4. Heart is ventral	4. Heart is dorsal (if present).
5. A post anal part(tail) is present	5. Post anal tail is absent.

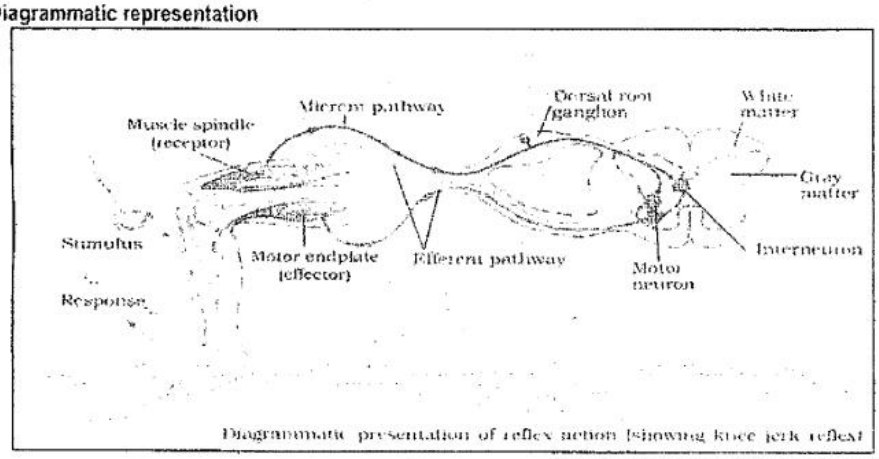
-One mark for each difference

29 Draw a labeled diagram of complete digestive system of frog showihg internal organs. 5 116

	 Diagrammatic representation of internal organs of frog showing complete digestive system Diagram with 10 labeling-½marks for each labeling		
30	**List the functions of plasma membrane.** **Functions of plasma membrane:** **i. Passive transport:** Movement of molecules across the membrane without the expenditure of energy. **ii. Diffusion:** Movement of substances like neutral solutes across plasma membrane along the concentration gradient. **Iii. Osmosis:** Movement of water molecules across the membrane along the concentration gradient. **iv. Facilitated transport:** Movement of polar molecules with the help of carrier proteins of the membrane to facilitate their transport across the membrane. **v. Active transport:** Movement of ions or molecules across the concentration gradient with the expenditure of energy **-One mark for each function**	5	132
31	**Explain how the PH and concentration of substrate affect enzyme activity with graphical representation.** Effect of PH on enzyme activity: Enzymes generally function in a narrow range of PH. Each enzyme shows its highest activity at a particular PH called optimum PH. Activity decreases both below and above optimum value.  **-1 mark for explanation and 1 mark for graphical representation** Effect of concentration of substrate on enzyme activity:	5	157 - 168

	With the increase in substrate concentration, the velocity of enzymatic reaction raises at first. The reaction ultimately reaches a maximum velocity (V_{max}) which is not exceeded by further raise in the concentrate of substrate.  -1 mark for explanation and 2 mark for graphical representation		
32	**Explain the physical properties of water that govern the transpiration driven ascent of sap. How these properties help in ascent of sap or transpiration pull and how a "pull" is achieved?** The transpiration driven ascent of xylem sap depends mainly on the following physical properties of water: • **Cohesion** – mutual attraction between water molecules. • **Adhesion** – attraction of water molecules to polar surfaces (such as the surface of tracheary elements. • **Surface Tension** – water molecules are attracted to each other in the liquid phase more than to water in the gas phase. 1½marks These properties give water high **tensile strength**, i.e., an ability to resist a pulling force, and high **capillarity**, i.e., the ability to rise in thin tubes. In plants capillarity is aided by the small diameter of the tracheary elements – **the tracheids and vessel elements.** 1½ marks The process of photosynthesis requires water. The system of xylem vessels from the root to the leaf vein can supply the needed water. As water evaporates through the stomata, since the thin film of water over the cells is continuous, it results in pulling of water, molecule by molecule, into the leaf from the xylem. Also, because of lower concentration of water vapour in the atmosphere as compared to the substomatal cavity and intercellular spaces, water diffuses into the surrounding air. This creates a 'pull' and helps in ascent of sap. 2 marks	5	188
	Section-II **Answer any THREE of the following questions in 200-250 words each, wherever applicable. 3x5=15**		
33	**What are macronutrients? Describe the roles played by calcium and magnesium in plants.** **Micronutrients** are those elements which are needed/present in large amounts, i.e., in excess of 10 m mole Kg^{-1} of dry matter. -1 Mark **Role of calcium:** Calcium is required by meristematic and differentiating tissues. During cell division, it is used for the synthesis of cell wall, particularly middle lamella. Calcium is also needed for the formation of mitotic spindle.	5	196 - 197

	Calcium is involved in the normal function of cell membrane. Calcium activates certain enzymes and plays an important role in regulating metabolic activities. **-any four roles-½mark for each role-2 marks** **Role of magnesium:** i. Magnesium activates the enzyme of respiration and photosynthesis. ii. Magnesium is involved in the synthesis of DNA and RNA. iii. Magnesium is needed for chlorophyll as a component of ring structure. iv. Magnesium is needed to maintain ribosome structure. **- Four roles-½mark for each role-2 marks**		
34	**Explain the events of C4 pathway. Mention any four special features of C4 plants.** **Steps involved in C4 pathway:** **CO2 fixation:** Phosphoenol pyruvate(PEP), a three carbon molecule present in the mesophyll cells, accepts a molecule of CO2 and forms a 4-carbon compound oxaloacetic acid(OAA). This reaction is catalyzed by the enzyme PEP carboxylase or PEPcase. **Conversion of OAA:** OAA then forms 4 carbon compounds like malic acid or aspartic acid in the mesophyll. Then Malic Acid is transported into bundle sheath cells. **Decarboxylation:** In the bundle sheath cells, CO2 released and CO2 enters into C3 or Calvin pathway. Regeneration of PEP: The PEP released during decarboxylation is transported back to mesophyll cells where it participates in CO2 fixation process. **-3 marks** **Special features of C4 plants:** i. They have special type of leaf anatomy, where they have large bundle sheath cells with large number of chloroplasts and thick wall and without intercellular spaces. ii. The C4 plants can tolerate higher temperatures. iii. They show response to high light intensities. iv. They lack a process called photorespiration. v. They have the ability of greater productivity of biomass. **-Any four such features-½ marks for each feature-2 marks**	5	218 - 23221
35	**Write the schematic representation of overall view of Citric Acid cycle.**  The Citric acid cycle	5	232

36	**Describe how the events of reflex action occur with a diagrammatic representation of knee jerk reflex.** The reflex action pathway comprises of following events. The stimulus is received by a receptor (eg. muscle spindle). Afferent neuron receives signals from this sensory organ and transmits the impulse via a dorsal nerve root into the CNS (at the level of spinal cord). The efferent neuron then carries the signals from CNS to the effectors. The stimulus and response thus forms a reflex arc. **-2 marks** **Diagrammatic representation**  Diagrammatic presentation of reflex action [showing knee jerk reflex] **Simplified diagram with proper labels** **-3 marks**	5	322
37	**What are hormones? Mention one function each for i) Adreno Cortico Trophic Hormone ii) Melatonin iii) Parathyroid hormone iv)Thymosin** Hormones are non-nutrient chemicals which act as intercellular messengers and are produced in trace amounts. **-1mark** **i. Adrenocorticotrophic hormone:** ACTH stimulates the synthesis and secretion of steroid hormones called glucocorticoids from the adrenal cortex. **ii. Melatonin:** Melatonin plays a very important role in the regulation of a 24-hour (diurnal) rhythm of our body. Melatonin helps in maintaining the normal rhythm of sleep-wake cycle. Melatonin helps in maintaining the normal body temperature. Melatonin also influences metabolism Melatonin also influences pigmentation Melatonin also helps in maintaining the menstrual cycle as well as our defense capacity **iii.Parathyroid hormone:** Parathyroid hormone increases the Ca^{2+} levels in the blood. Parathyroid hormone acts on bones and stimulates the process of bone resorption/dissolution/demineralization. Parathyroid hormone also stimulates the reabsorption of Ca^{2+} by the renal tubules and increases CA^{2+}absorption from the digested food. Parathyroid hormone, along with thyrocalcitonin, plays a significant role in calcium balance in the body. **iv. Thymosin:** Thymosin plays a major role in the differentiation of T-Lymphocytes which provide cell-mediated immunity. **-Any one function for each horomone-1mark each-4 marks**		332 - 334

BIOLOGY (THEORY) : MODEL QUESTION PAPER – 2

BLUE PRINT FOR SUMMATIVE ASSESSMENT (UNIT WISE WEIGHTAGE)

Time : 3 Hours and 15 minutes | I PUC | Maximum Marks : 70

UNIT NO	UNIT	TEACHING HOURS	KNOWLEDGE				UNDERSTANDING				APPLICATION/ APPRECIATION				EXPRESSION/ SKILL				TOTAL QUESTIONS				MARKS WEIGHTAGE
		120	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	
I	DIVERSITY OF LIVING ORGANISMS	19	1	2		1		1				1	1						1	4	1	1	17
II	STRUCTURAL ORGANIZATION IN PLANTS ANIMALS	17	1			1			1		1							1	2		1	2	15
III	CELL STRUCTURE AND FUNCTION	19	2	1	1					1	1							1	3	1	1	2	18
IV	PLANT PHYSIOLOGY	31	4*	1				1	2	1			1*	1					2	2	2	3	27
V	HUMAN PHYSIOLOGY	34	2	1	3					2*								1	3	3	3	2	28
		120	40 % 42 marks				30% 33marks				15 % 15marks				15% 15 marks				10	08	08	11	105

NOTE:

1) The question paper must be prepared based on the individual blue print on the basis of weightage of marks fixed for each chapter.
2) A variation of 1% per objective weightage is allowed.
3) A variation of 1 mark per unit/chapter is allowed. However, the total marks should not exceed 105 marks.
4) At least one question each carrying 1 mark, 2 marks, 3 marks and 5 marks have to be derived from each unit.
5) When a question carrying 5 marks is divided into sub-questions (3+2/2+2+1), the sub-questions have to be derived from the same chapter.
6) When a question carrying 5 marks is divided into sub-questions, the sub-questions have to be derived from different topics of the same chapter.
7)* Split questions

BIOLOGY (THEORY) : MODEL QUESTION PAPER – 2

BLUE PRINT FOR SUMMATIVE ASSESSMENT (CHAPTER WISE WEIGHTAGE)

Time : 3 Hours and 15 minutes — I PUC — Maximum Marks : 70

UNIT NO	HOURS	CHAPTER	HOURS	MARKS PER UNIT	KNOWLEDGE				UNDERSTANDING				APPLICATION/ APPRECIATION				SKILL				TOTAL				TOTAL MARKS
					1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	
UNIT I-DIVERSITY OF LIVING ORGANISMS																									
I	19	1.LIVING WORLD	3	18	1	1															1	1			3
		2.BIOLOGICAL CLASSIFICAITON	2			1																1			2
		3.PLANT KINGDOM	6											1	1							1	1		5
		4.ANIMAL KINGDOM	8					1		1												1		1	7
UNIT II-STRUCTURAL ORGANIZATION IN PLANTS AND ANIMALS																									
II	17	5.MORPHOLOGY OF FLOWERING PLANTS	5	15	1						1										1		1		4
		6.ANATOMY OF FLOLWERING PLANTS	4																	1				1	5
		7.STRUCTURAL ORGANISATION IN ANIMALS	8					1					1								1			1	6
UNIT III-CELL STRUCTURE AND FUNCTION																									
III	19	8.CELL-THE UNIT OF LIFE	10	17	1	1							1							1	2	1		1	9
		9.BIOMOLECULES	5		1		1														1		1		4
		10.CELL CYCLE AND CELL DIVISION	4									1												1	4
UNIT IV-PLANT PHYSIOLOGY																									
IV	31	11.TRANSPORT IN PLANTS	7	27	1							1									1			1	6
		12.MINERAL NUTRITION	7		3*										1*						1			1*	6
		13.PHOTOSYNTHESIS IN HIGHER PLANTS	5													1								1	5
		14.RESPIRATION IN PLANTS	5			1					1											1	1		5
		15.PLANT GROWTH AND DEVELOPMENT	7							1	1											1	1		5
UNIT V-HUMAN PHYSIOLOGY																									
V	34	16.DIGESTION AND ABSORPTION	4	28			1																1		3
		17.BREATHING AND EXCHANGE OF GASES	4				1																1		3
		18.BODY FLUIDS AND CIRCULATION	5									1												1	5
		19.EXCRETORY PRODUCTS & ELIMINATION	4				1																1		3
		20.LOCOMOTION AND MOVEMENT	5		1	1															1	1			3
		21.NEURAL CONTROL & CO-ORDINATION	6																	1				1	5
		22.CHEMICAL CO-ORDINATION AND INTEGRATION	6		1							1									1			1	6
	120	TOTAL	120	105																	10	8	8	11	105

MODEL QUESTION PAPER – 2
SUBJECT: BIOLOGY (36)

I PUC

Time: 3 Hours and 15 minutes **Maximum Marks: 70**

GENERAL INSTRUCTIONS:

i) *The question paper consists of four parts **A**, **B**, **C** and **D** . Part D consists of two parts, **Section-I** and **Section-II**. Part A contains of **10** questions of **one** mark each, Part B is of **8** questions of **two** marks each, Part C is of **8** questions of **three** marks each, Part D – Section I is of **6** questions of **five** marks each and Part D – Section II is of 5 questions of **five** marks each.*

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. What is herbarium?
2. Define venation.
3. "Earthworms are called friends of farmers". Justify the statement.
4. What are chromoplasts?
5. Name the organic compounds (non-protein constituent) present in certain enzymes that are tightly bound to the apoenzyme.
6. Why are mitochondria called "power houses of the cell"?
7. Define osmosis.
8. Name the essential element that is present in chlorophyll.
9. Name the red coloured oxygen storing pigment present in muscles.
10. Mention the hormone that regulates 24-hour (diurnal) rhythm of human body.

PART – B

Answer any FIVE of the following questions in 3 – 5 sentences each, wherever applicable: 5 x 2 = 10

11. Mention two rules of binomial nomenclature.
12. Write any two classes of Kingdom Fungi with one example for each class.
13. (a) Why bryophytes are called amphibians of the plant kingdom?
    (b) Cycas is considered as a naked seeded plant. Give a scientific reason.
14. Write two differences between cartilaginous and bony fishes.
15. List two functions of Golgi bodies.
16. Define respiratory quotient. Write the RQ value for glucose.
17. Differentiate long day plants and short day plants.
18. Mention two types of movements exhibited by the cells of human body with an example for each.

PART – C

Answer any FIVE of the following questions in 40 – 80 words each, wherever applicable: 5 x 3 = 15

19. Schematically represent the haplontic life cycle in plants.
20. Explain any three types of aestivation in flowering plants.

21. Differentiate homopolymers and heteropolymers (polysaccharides) with an example each.
22. Write the schematic representation of steps involved in the formation of ethyl alcohol during fermentation of glucose.
23. Write about any three disorders of the digestive system.
24. What is: (a) Tidal volume (b) Residual volume (c) Vital capacity?
25. How are differentiation, dedifferentiation and redifferentiation different from each other?
26. Classify the animals with an example each based on the chief excretory product produced in them.

PART – D

Section -I

Answer any FOUR of the following questions in 200 – 250 words each, wherever applicable: **4 x 5 = 20**

27. List five characteristic features of birds.
28. Describe the important events that occur during anaphase and telophase of mitosis.
29. Draw a labelled diagram showing the anatomy of the leaf of a typical monocot plant.
30. (a) Carbon,nitrogen, phosphorous, sulphur, calcium, etc, are considered as essential elements. What are the criteria for considering them as essential? (3)
    (b) What is the role of leg-haemoglobin in leguminous plants? (1)
    (c) Name a soil bacterium which helps in nitrification. (1)
31. Write the schematic representation of Calvin cycle.
32. Mention one function each of the following hormones:
    (a) ADH (b) Thymosin (c) Glucagon (d) Atrial natriuretic factor (e) Erythropoietin

Section -II

Answer any THREE of the following questions in 200 – 250 words each, wherever applicable: **3 x 5 = 15**

33. Draw a labelled diagram showing the ultrastructure of a plant cell.
34. Classify simple epithelium and mention the structural modifications of cells in them.
35. Explain pressure flow hypothesis of translocation of organic solutes.
36. (a) Explain the mechanism of clotting of blood. (3)
    (b) Differentiate pulmonary and systemic circulations. (2)
37. Draw a labelled diagram of the human brain in sagittal section.

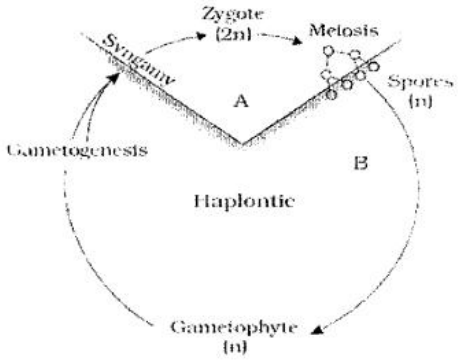
MODEL QUESTION PAPER (THEORY) – 2

SUBJECT : BIOLOGY (36)

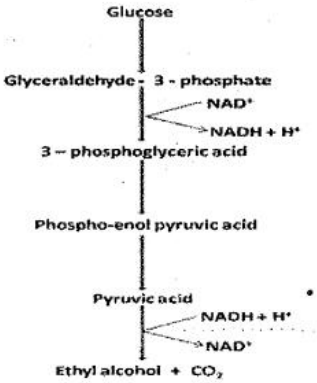
I PUC

Scheme of Evaluation

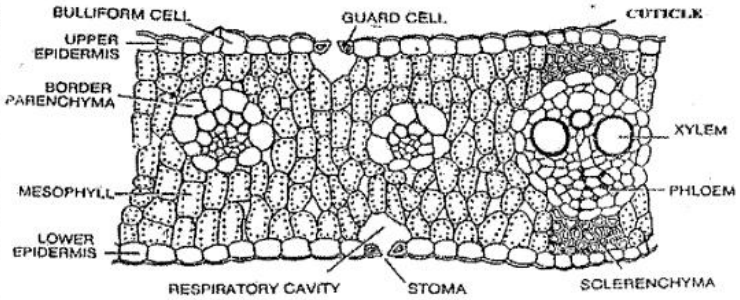
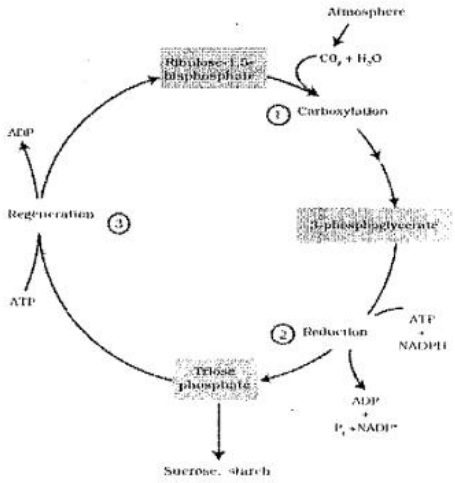
Q. No.	ANSWER	MARKS
	PART – A	
1	• Storehouse of collected plant specimens that are dried, pressed and preserved on sheets	1
2	• Arrangement of veins and veinlets in the leaf lamina	1
3	• Make burrows in the soil and make it porous which helps in respiration and penetration of the developing roots. • They increase the fertility of soil through their worm castings. **ANY ONE**	1
4	• Plastids containing fat soluble carotenoid pigments / pigments other than chlorophyll	1
5	• Prosthetic group	1
6	• Produce cellular energy in the form of ATP	1
7	• Diffusion of water across a differentially or semi-permeable membrane	1
8	• Magnesium / Mg	1
9	• Myoglobin	1
10	• Melatonin	1
	PART – B	
11	**Rules of binomial nomenclature:** • Name should be in Latin or Latinised irrespective of their origin. • The first word represents genus and the second component, the species. • Both the components of the name are printed in italics or underlined separately when handwritten. • The genus name should start with capital letter and the species name should start with small letter. **ANY TWO → 2 x 1**	2
12	**Classes of Fungi and examples:** • Ascomycetes → Yeast (Saccharomyces) / Penicillium / Aspergillus / Claviceps / Neurospora • Basidiomycetes → Agaricus (mushroom) / Ustilago (smut) / Puccinia (rust fungus) • Phycomycetes → Mucor / Rhizopus (bread mould) / Albugo • Deuteromycetes → Alternaria / Colletotrichum / Trichoderma **MENTIONING OF TWO CLASSES → 2 X ½** **ONE EXAMPLE EACH FOR THE MENTIONED CLASS → 2 X ½**	1 1
13	• (a) Bryophytes can live in soil but require water to complete sexual reproduction.	1

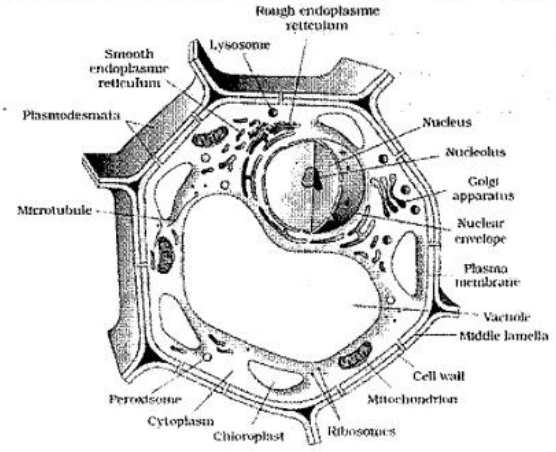
<table>
<tr><td></td><td>• (b) Ovules are not enclosed by any ovary wall and remain exposed.</td><td>1</td></tr>
<tr><td>14</td><td>Differences between cartilaginous and bony fishes:
<table>
<tr><th>CARTILAGINOUS FISHES</th><th>BONY FISHES</th></tr>
<tr><td>Mouth is ventrally located</td><td>Mouth is terminally located</td></tr>
<tr><td>Operculum absent</td><td>Operculum covers the gills</td></tr>
<tr><td>Air bladders absent</td><td>Air bladders present</td></tr>
<tr><td>Males have claspers</td><td>Claspers absent</td></tr>
<tr><td>Fertilisation is internal</td><td>Fertilisation is usually external</td></tr>
<tr><td>Mostly viviparous</td><td>Mostly oviparous</td></tr>
</table>
ANY TWO DIFFERENCES: 2 x 1</td><td>2</td></tr>
<tr><td>15</td><td>Functions of Golgi bodies:
• Packaging of materials produced by ER
• Modification of proteins synthesised by ribosomes
• Site of formation of glycoproteins and glycolipids
ANY TWO FUNCTIONS: 2 x 1</td><td>2</td></tr>
<tr><td>16</td><td>Respiratory quotient:
• Ratio of volume of CO_2 evolved to the volume of O_2 consumed in respiration</td><td>1</td></tr>
<tr><td></td><td>RQ Value of glucose → 1</td><td>1</td></tr>
<tr><td>17</td><td>Long day plants: Plants that require the exposure to light for a period exceeding a well defined critical duration.</td><td>1</td></tr>
<tr><td></td><td>Short day plants: Plants that require the exposure to light for a period less than the well defined critical duration.</td><td>1</td></tr>
<tr><td>18</td><td>Movements exhibited by the cells of human body:
• Amoeboid → Ex: macrophages / Leucocytes
• Ciliary → Ex: ciliated epithelium of trachea / female reproductive tract
• Muscular → Ex: movement of limbs / jaws / tongue, etc.
MENTIONING TWO TYPES OF MOVEMENT: 2 X ½</td><td>1</td></tr>
<tr><td></td><td>ONE EXAMPLE EACH FOR THE MENTIONED TYPE OF MOVEMENT: 2 X ½</td><td>1</td></tr>
<tr><td></td><td>PART – C</td><td></td></tr>
<tr><td>19</td><td>Haplontic life cycle in plants:


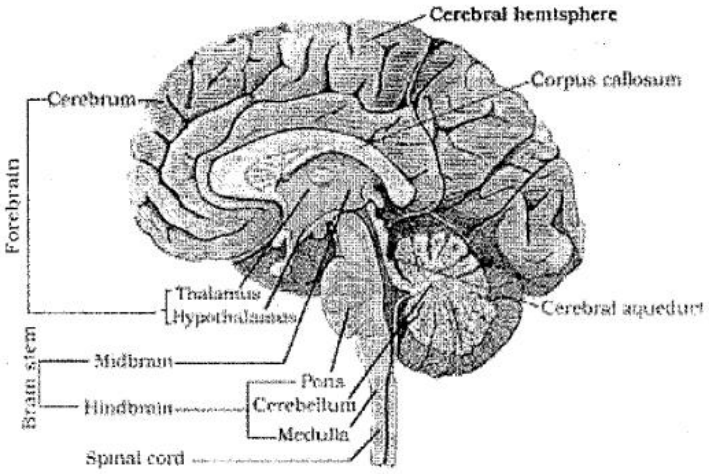
MENTIONING OF EACH STEP AND EVENT / PROCESS IN THE CYCLE: ½ M (6 x ½)</td><td>3</td></tr>
</table>

20	**Aestivation in angiosperms:** • **Valvate:** Sepals or petals in a whorl touch one another at the margin, without overlapping. • **Twisted:** One margin of the sepal or petal overlaps that of the next one and so on. • **Imbricate:** Margins of sepals or petals overlap one another but not in any particular direction. • **Vexillary / Papilionaceous:** There are five petals. Large standard petal overlaps the two lateral / wing petals which in turn overlap the two smallest anterior keel petals. **MENTIONING OF THREE TYPES OF AESTIVATION: 3 X ½** **EXPLANATION OF THE MENTIONED TYPES OF AESTIVATION: 3 X ½**	 1½ 1½
21	**Difference between homopolymers and heteropolymers (polysaccharides):** **Homopolymers:** • Consist of only one type of monosaccharide Ex: cellulose / starch / glycogen / inulin **ANY ONE** **Heteropolymers:** • Consist of different types of monosaccharides Ex: chitin	 1 ½ 1 ½
22	**Alcohol fermentation:**  **EACH STEP: ½ Mark → 5 x ½** **FORMATION AND UTILISATION OF NADH+H⁺**	 2½ ½
23	**Disorders of the digestive system:** **Inflammation of the intestinal tract:** Caused due to bacterial or viral infections and by the parasites of the intestine like tape worm, round worm, thread worm, hook worm, pin worm, etc. **Jaundice:** The liver is affected. Skin and eyes turn yellow due to the deposition of bile pigments. **Vomiting:** It is a reflex action in which the contents of the stomach are ejected. A feeling of nausea precedes vomiting. **Diarrhoea:** It is the abnormal frequency of bowel movement and increased liquidity of the faecal discharge which reduces the absorption of food.	

	Constipation: It is a condition in which the faeces are retained within the rectum as the bowel movements occur irregularly. **Indigestion:** It is the improper digestion of food leading to a feeling of fullness which is caused due to inadequate enzyme secretion, anxiety, food poisoning, over eating, and spicy food. **MENTIONING ANY THREE DISORDERS: 3 X ½** **EXPLANATION OF THE MENTIONED DISORDERS: 3 X ½**	 **1½** **1½**
24	**(a) Tidal Volume:** Volume of air inspired or expired during a normal respiration. **(b) Residual Volume:** Volume of air remaining in the lungs even after a forcible expiration. **(c) Vital Capacity:** The maximum volume of air a person can breathe in after a forced expiration.	**1** **1** **1**
25	**Differentiation:** It is the maturation of cells derived from meristems to perform specific functions. **Dedifferentiation:** It is the regaining of the capacity to divide by the cells that have lost the capacity to divide. **Redifferentiation:** It is the specialization of the cells obtained from the division of dedifferentiated cells to perform specific functions.	**1** **1** **1**
26	**Classification of animals based on the chief excretory material produced:** **Ammonotelic animals:** Ex – fish **Ureotelic animals**: Ex – mammals, many terrestrial amphibians and marine fishes **Uricotelic animals**: Ex – reptiles, birds, land snails and insects **MENTIONING OF TYPES BASED ON EXCRETORY PRODUCT: 3 X 1 → 1½** **ONE EXAMPLE EACH FOR EACH OF THE TYPE OF ANIMALS: 3 X 1 → 1½**	 **1½** **1½**
	PART – D ***Section – I***	
27	**Characteristics of birds:** • They possess beak. • The forelimbs are modified into wings. • The hind limbs generally have scales and are modified for walking, swimming or clasping the tree branches. • Skin is dry without glands except the oil gland at the base of the tail. • The long bones are hollow with air cavities (pneumatic). • The digestive tract of birds has additional chambers, the crop and gizzard. • Heart is completely four chambered. • They are warm-blooded (homoiothermous) animals. • Respiration is by lungs and is supplemented by air sacs connected to lungs. • Sexes are separate, fertilisation is internal and development is direct. • They are oviparous. **ANY FIVE FEATURES: 5 x 1**	 **1**
28	**Events that occur during anaphase and telophase of mitosis:** **Anaphase:** • Centromeres split and chromatids separate. • Chromatids move to opposite poles.	 **1** **1**

	Telophase: • Chromosomes cluster at opposite spindle poles and their identity is lost. • Nuclear envelope forms around the chromosome clusters. • Nucleolus, golgi complex and ER reform.	 1 1 1
29	**T.S. of Monocot leaf:**  **NEAT AND CORRECT DIAGRAM** **ANY SIX CORRECT LABELLINGS: 6 x ½**	 2 3
30	**(a) The criteria for essentiality of elemenst are:** • The element must be absolutely necessary for supporting normal growth and reproduction and in their absence, the plants do not complete their life cycle or set the seeds. • The requirement of the element must be specific and not replaceable by another element. • The element must be directly involved in the metabolism of the plant. **(b) Leg-haemoglobin** protects nitrogenase enzyme from oxygen and acts as an oxygen scavenger. **(c)** Nitrosomonas / Nitrococcus / Nitrobacter **ANY ONE**	 1 1 1 1 1
31	**Calvin cycle:**  **NAMING DIFFERENT STEPS AND INTERMEDIATE COMPOUNDS** **SHOWING THE UTILISATION OF CO_2, ATP AND NADPH**	 3 2

32	**Role of hormones:** **(a) ADH:** • Stimulates reabsorption of water and electrolytes in the kidney tubules. **(b) Thymosin:** • Promotes the differentiation of T – **lymphocytes** to provide **cell – mediated immunity**. • Promotes the production of antibodies to provide **humoral immunity**. **ANY ONE** **(c) Glucagon:** • Promotes glycogenolysis and increases blood sugar level. • Promotes gluconeogenesis and increases blood sugar level. • Reduces the cellular glucose uptake and utilisation. **ANY ONE** **(d) Atrial natriuretic factor:** • Causes dilation of the blood vessels and reduces the blood pressure. • Checks rennin – angiotensin mechanism in the kidneys. **ANY ONE** **(e) Erythropoietin:** • Stimulates erythropoiesis / formation of RBCs.	 1 1 1 1 1
	Section – II	
33	**Ultrastructure of plant cell: <u>(ONLY A SIMPLE LINE DIAGRAM IS EXPECTED)</u>**  **NEAT AND CORRECT DIAGRAM** **ANY SIX CORRECT LABELLINGS: 6 x ½**	 <

	Glandular epithelium: • Cells are columnar and cuboidal which are specialized for secretion.	1
35	**Mass flow hypothesis:** • Glucose is prepared at the source by photosynthesis is converted to sucrose which moves into the companion cells and then loaded into the sieve tube cells by active transport. • A hypertonic condition is developed in the phloem and therefore, water in the adjacent xylem moves into the phloem by osmosis. • Osmotic pressure builds up in the phloem and the phloem sap will move to areas of lower pressure like sink. • At the sink, sucrose moves out of the phloem sap by active transport into the cells which will use the sugar. • As sugars are removed, the osmotic pressure decreases and water moves out of the phloem.	1 1 1 1 1
36	**(a) Clotting of blood:** • An injury or a trauma stimulates the platelets in the blood to release certain factors like thrombokinase which activate the mechanism of coagulation. • Certain factors released by the tissues at the site of injury and calcium ions also play a very important role in clotting. • Thrombokinase converts inactive prothrombin into active thrombin. • Thrombin converts fibrinogen, a plasma protein into a network of fibrin threads.	½ ½ 1 1
37	**Sagittal section of human brain:**  **NEAT AND CORRECT DIAGRAM** **ANY SIX CORRECT LABELLINGS: 6 x ½**	2 3

Blue Print of the Question Paper 03

Time: 3.15Hours **I PUC BIOLOGY** **Max Marks: 70**

Sl. No.	UNIT	Teaching Hours	Knowledge				Understanding				Application Appreciation				Expression Skills				Total				Marks Weightage
	II PUC	120	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	
1.	DIVERSITY IN THE LIVING WORLD.	19	2	1		1	1	1		1									3	2		2	17
2.	STR. ORG IN PLANTS & ANIMALS.	17	1		1				1			1				1	1	1	1	2	2	1	16
3.	STRUCTURE AND FUNCTIONS.	19			1	1			1	1	1								1		2	2	17
4.	PLANT PHYSIOLOGY	31	1	1	1	1		1		1	1			1					2	2	2	3	27
5.	ANIMAL PHYSIOLOGY	34	1	2	1		1		1	1	1			1				1	3	2	2	3	28
Total Number of Qns.			5	4	4	3	2	2	3	4	3	1	-	2	-	1	1	2	10	8	8	11	105
Grand Total of Marks and Percentage			**40Marks (40%)**				**35 Marks (30%)**				**15 Marks (15%)**				**15 Marks (15%)**								

Note: 1) The question paper must be prepared based on the individual blue print which is based on the weightage of marks fixed for each Unit /chapter.

I PUC

MODEL QUESTION PAPER 03

Time: 3.15 Hours **Max. Marks: 70**

General Instructions:
i. This question paper consists of five parts A, B, C and D.
ii. All the parts are compulsory.
iii. Draw diagrams whenever necessary.
Unlabelled diagrams or illustrations do not attract any marks.

PART – A

Answer the following questions in *one word* or *one sentence* each: **10x1=10.**

1. Name the kingdom that includes prokaryotes.
2. What is Herbarium?
3. Define species.
4. Mention the living component of xylem.
5. Mitochondria are called as semiautonomous structure. Why?
6. Why RUBISCO is must for C_3 plants?
7. Name the gaseous hormone
8. Which hormone deficiency causes Diabetes insipidus?
9. What is the roll of corpus callosum?
10. Name the smallest lymph vessel.

PART - B

Answer any FIVE of the following questions in *3-5 sentences* each: **5x2=10**

11. Write four salient features of archaebacteria.
12. Which generations dominate in diplontic lifecycle? Give two examples for diplontic life cycle.
13. Draw a neat labeled diagram of loose C. T.
14. Earthworms are called as "friends of farmers". Justify.
15. Define guttation. Which part of the day guttation occurs?
16. Who proposed Law of Limiting factors? Define the law.
17. Name the parts of mid brain.
18. Write note on CAD.

PART - C

Answer any FIVE of the following questions in *100-150 words* each, wherever applicable:

5x3=15.

19. Classify types of muscular tissue. Write two vital points of any one muscular tissue.
20. Based on position of floral parts on thalamus classify flowers. Mention an example for each.
21. What is a mesosome in prokaryotic cell? Enumerate its function.
22. Define enzyme. Write any four properties of it.

23. With reference to solution define following terms. A) Isotonic solution, B) Hypo solution & Hyper solutions.
24. What is a deficiency symptom of essential elements? What are its symptoms?
25. Write note on gastric digestion.
26. Other than blood which circulatory medium is present in vertebrates? Add note on it.

PART – D
SECTION I

Answer any FOUR of the following questions in *200-250 words* each, wherever possible: 4x5=20

27. Write salient features of Pteridophyta
28. Explain the structure of nucleus.
29. Define photoperiodism. Classify plants based on it.
30. Explain pressure flow hypothesis.
31. Name any five hormones secreted by hypophysis with one function of each.
32. Explain Erythroblastsis foetalis.

SECTION II

Answer any THREE of the following questions in *200-250 words* each, wherever possible: 3x5=15.

33. Draw neat labeled diagram of alimentary canal of cockroach.
34. With the help neat diagram write note on fluid mosaic model of plasma membrane, mention any two functions of it.
35. Write schematic representation of EMP pathway.
36. Draw a neat labeled diagram of nephron.
37. Write differences between non-chordate and chordate.

I PUC

SCHEME OF EVALUATION

PART –A

1. Kingdom Monera. 1
2. Herbarium is a store house of collected plant specimens that are dried, pressed & preserved on sheets & arranged according to a system of classification. 1
3. A group of closely related organisms capable of inbreeding to produces fertile offspring. 1
4. Xylem parenchyma. 1
5. As it has its own DNA. 1
6. Without RUBISCO co_2 cannot enter Clavin cycle or carboxylation is not possible. 1
7. Ethylene. 1
8. ADH. 1
9. It helps in binding two cerebral hemispheres. 1
10. Lacteal capillary. 1

PART –B

11. Any four points as given in the book. Each point ½ marks.
12. Sporophyte dominate diplontic life cycle. Eg; Gymnosprems & Angiosprems. 1+½+½.
13. Refer Biology prescribed text book for I PUC, Page no 103, fig 7.4 (a). Each label ½ mark.
14. They burrow in the soil and make it porous which helps in respiration,
    ii) Helps in penetration in the soil,
    iii) Increasing soil fertility. Any two points only. Each point 1 mark.
15. Guttation is defined as "loss of water in the form of liquid through speclized called hydathode" it occurs during night time.
16. Blackmann. 1 mark.
    "If a physiological process is control by more than one factor, then its rate will be determined by the factor which is nearest to its minimal valve: it is the factor which directly affects the process if its quantity in changed." 1mark.
17. I) Cerebral aqueduct 1 mark.
    ii) Corpora quadrigemina 1 mark.
18. CAD: Coronary Artery Disease, often referred to as Atherosclerosis. i 1 mark.
    It is caused by deposition of calcium, fat, cholesterol & fibrous tissues, which narrows lumen of artey. 1mark.

PART – C

19. Classication 1 mark.
    Any two points. Each point 1 mark.
20. A) Hypogynous with one example. ½ + ½ marks.
    B) Epigynous with one example. ½ + ½ marks.

C) Perigynous with one example. ½ + ½ marks.

22. Defn: "It is biocatalyst which alters the rate of reaction, without undergoing any change by itself" 1 mark.
    Any four properties. Each point ½ marks.
23. Isotonic solution: The external solution balances with osmotic pressure of the cytoplasm or cell. 2 mark.
    Hypotonic solution: Less concentration than isotonic solution. ½ mark.
    Hypertonic solution: More concentration than isotonic solution. ½ mark.
24. The morphological changes are indicative of certain elements are called deficiency symptom.
    Its symptoms are chlorosis, necrosis and stunted growth, premature fall of leaves & buds and inhibition of cell division. (Any two symptoms) 1+½+½ marks.
25. Gastric digestion: Role of Hcl. 1 mark.
    Pepsinogen to active Pepsin. ½ mark.
    Role of Pepsin. 1mark.
    Prorennin to active Rennin. ½ mark.
    Role of Rennin. 1mark.
    Definition of chyme. 1mark.
26. Lymph (Tissue Fluid) 1 mark.
    *It is extra cellular fluid (ECF) *It is identical to blood plasma.* It has leucocytes. *It consists of lymph node, lymph vessels and the smallest lymph vessel is called lacteal capillary. * Lymph nodes produce lymph. (Any four points) Each point ½ marks.

PART- D

SECTION –I

27. Refer Biology prescribed text book for I PUC, Page no 36 & 38. Each point 1 mark.
28. Refer Biology prescribed text book for I PUC, Page no 138. Each point 1 mark.
29. Definition of photoperiodism. 2 marks.
    Classification: Long day plants, Definition. ½+½ mark.
    Short day plants, Definition. ½+½ mark.
    Neutral day plants, Definition. ½+½ mark.
30. Refer Biology prescribed text book for I PUC, Page no 191. Each point 1 mark.
31. Refer Biology prescribed text book for I PUC, Page no 332. Each point 1 mark.
    Note: Any hormone of adenohypophysis only, but not neurohypophysis.
32. Refer Biology prescribed text book for I PUC, Page no 281. (Case study.)

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