

IPUC SET IV

UNIT NO	HOURS	CHAPTER	HOURS	MARKS	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	4	
		2.BIOLOGICAL CLASSIFICATION	2																		1		2		
		3.PLANT KINGDOM	6																				1	5	
		4.ANIMAL KINGDOM	8																			1		7	
UNIT II.STRUCTURAL ORGANIZATION IN PLANTS AND ANIMALS																									
II	17	5.MORPHOLOGY OF FLOWERING PLANTS	5	15	1	1				1												2	1	4	
		6.ANATOMY OF FLOWERING PLANTS	4		1														1		1		4		
		7.STRUCTURAL ORGANISATION IN ANIMALS	8																	1		1	7		
UNIT III.CELL STRUCTURE AND FUNCTION																									
III	19	8.CELL--THE UNIT OF LIFE	10	17	1														1			1	1	8	
		9.BIOMOLECULES	5																				1	5	
		10.CELL CYCLE AND CELL DIVISION	4																		1	1		4	
UNIT IV.PLANT PHYSIOLOGY																									
IV	31	11.TRANSPORT IN PLANTS	7	27	1																	1		6	
		12.MINERAL NUTRITION	7																			1		6	
		13.PHOTOSYNTHESIS IN HIGHER PLANTS	5																				1	5	
		14.RESPIRATION IN PLANTS	5																				1	5	
		15.PLANT GROWTH AND	7																				1	1	5

MODEL QUESTION PAPER-4

SUBJECT: BIOLOGY (36)

Time: 3 Hours 15 Minutes

PUC-I

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/ one sentence each

10 X 1= 10

1. Define genus.
2. What are adventitious roots?
3. Name the living mechanical tissue in plants.
4. What do you mean by metacentric chromosome?
5. Define crossing over.
6. What is a parthenocarpic fruit?
7. What is plasmolysis?
8. Write the dental formula of man.
9. What is ammonification?
10. Expand ECG.

PART-B

Answer any FIVE of the following questions in 3 -5 sentence each wherever applicable. 5 X 2= 10

11. Write the difference between virus and viroids.
12. What are acoelomates? Give one example.
13. Name the four whorls of flower.
14. Differentiate the skeletal muscle from smooth muscle.
15. Sketch and label the structure of chromosome.
16. Write any two practical applications of ethylene.
17. What are myofibrils? Name two important proteins present in myofibrils.
18. List the functions of HCl in digestion.

PART-C

**Answer any FIVE of the following questions in 100-150 words each wherever applicable.
5 X 3= 15**

19. Write any three characteristics of living organisms.
20. Briefly explain the events of mitotic prophase.
21. Draw a neat labeled diagram of T.S. of Dicot leaf.
22. Define the following: a) Differentiation, b) Dedifferentiation, c) Redifferentiation.
23. Give a brief account on respiratory disorders.
24. Explain the mechanism of blood clotting.
25. Explain the process of ultra filtration.
26. Mention three types of cellular movements in human body with an example.

PART-D Section -I

**Answer any FOUR of the following questions in 200-250 words each wherever applicable.
4 X 5= 20**

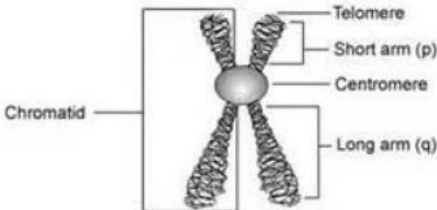
27. Write the general characteristics of angiosperms.
28. Enumerate the features of animals belongs to arthropods.
29. Draw a neat labeled diagram of cockroach male reproductive system.
30. Describe the structure of chloroplast.
31. Name the building blocks of proteins and explain the structural aspects of proteins.
32. Explain the pathway of water movement in root.

Section -II

Answer any THREE of the following questions in 200-250 words each wherever applicable. 3 X 5= 15

33. What are macronutrients? Mention the role of any four macronutrients.
34. Define law of limiting factor. Explain four external factors affecting the rate of photosynthesis.
35. Write the schematic representation of Glycolysis.
36. Draw a neat labeled diagram of sagital section of human brain.
37. Name the hormones of adrenal gland and mention their functions.

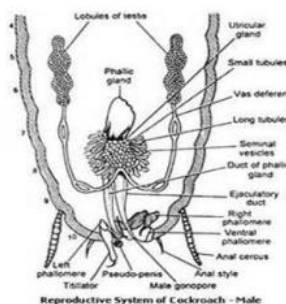
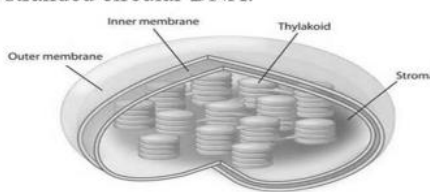
Q N o	Answers	Marks	Page No
PART-A			
1	Define genus. Genus is a group of related species which has more common characters in comparison to species of other genera.	01	09
2	What are adventitious roots? The roots developed from other than radicle parts.	01	66
3	Name the living mechanical tissue in plants. Collenchyma.	01	86
4	What do you mean by metacentric chromosome? The metacentric chromosome has middle centromere forming two equal arms.	01	139
5	Define crossing over. Exchange of genetic material between two non-sister chromatids of homologous chromosomes during prophase I of meiosis I.	01	168
6	What is a parthenocarpic fruit? It is the fruit formed without fertilization of the ovary.	01	76
7	What is plasmolysis? When a plant cell kept in hypertonic solution the water moves out of the cell as a result cell membrane (protoplast) shrinks is called plasmolysis.	01	181
8	Write the dental formula of man. 2123/2123	01	258
9	What is ammonification? Decomposition of organic nitrogen of dead plants and animals into ammonia is called ammonification.	01	201
10	Expand ECG. Electrocardiograph.	01	285
PART-B			
11	Write any two differences between virus and viroids.		1x2=02 26 & 27
	Virus	Viroids	
	1. It is composed of nucleic acid and protein. 2. Infects both animals and plants. 3. These have high molecular weight.	1. It is composed of only RNA. 2. Infects only plants. 3. These have low molecular weight.	
	Any two, one mark each		

Q N o	Answers	Marks	Page No												
12	What are acoelomates? Give one example. The animals in which body cavity is absent are called acoelomates. Example: Tapeworm, Liverfluke. Definition 1 Mark. One example 1 Mrk.	1+1=0 2	48&51												
13	Name the four whorls of flower. The four whorls are –calyx, corolla, androecium and gynoecium.	$\frac{1}{2} \times 4 = 02$	73& 74												
14	Differentiate the Skeletal muscle from smooth muscle. Any four differences- $\frac{1}{2}$ mark each <table><thead><tr><th>Skeletal muscle</th><th>Smooth muscle</th></tr></thead><tbody><tr><td>1.The muscles are attached to bone</td><td>1. The muscles are present around blood vessels, inner wall of stomach and intestine.</td></tr><tr><td>2. Alternative dark and light bands present</td><td>2. Dark and light bands absent.</td></tr><tr><td>3. Elongated with cylindrical in shape.</td><td>3. Elongated with pointed ends.</td></tr><tr><td>4. Cells are multinucleated.</td><td>4. Cells are uninucleated.</td></tr><tr><td>5. Voluntary in function.</td><td>5. Involuntary in function.</td></tr></tbody></table>	Skeletal muscle	Smooth muscle	1.The muscles are attached to bone	1. The muscles are present around blood vessels, inner wall of stomach and intestine.	2. Alternative dark and light bands present	2. Dark and light bands absent.	3. Elongated with cylindrical in shape.	3. Elongated with pointed ends.	4. Cells are multinucleated.	4. Cells are uninucleated.	5. Voluntary in function.	5. Involuntary in function.	$\frac{1}{2} \times 4 = 02$	104 & 105
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5. Voluntary in function.	5. Involuntary in function.														
15	Sketch and label the structure of chromosome. 	$\frac{1}{2} \times 4 = 02$	139												
16	Write any two practical applications of ethylene. • It helps in ripening of fruits. • It promotes senescence and abscission of plant organs. • It breaks seed and bud dormancy. • It initiates germination in peanut seeds. Any two applications – 1 mark each	1x2=02	250												
17	What are myofibrils? Name the two important proteins present in myofibrils. • Parallely arranged filaments in the sarcoplasm of the muscles are called myofibrils. • The proteins are Actin and Myosin. One mark each	1+1=0 2	304												

18	List the functions of HCl in digestion. * It helps to maintain acidic pH in the stomach. * It converts inactive pepsinogen to pepsin and prorenin to rennin. One mark each	$1+1=0$ 2	262
PART-C			
19	Write any three characteristics of living organisms. * Growth. * Reproduction. * metabolism Consciousness. One mark each	$1 \times 3 = 0$ 3	3,4&5
Q N o	Answers	Marks	Page No
20	Briefly explain the events of mitotic prophase. • Chromosomal material condenses to form thick thread like structures called chromosomes. • Centrioles move towards opposite poles. • Nuclear membrane and nucleolus disappears. • Assembling of mitotic spindles and microtubules. Any three points one mark each	$1 \times 3 = 0$ 3	164
21	Draw a neat labeled diagram of T.S. of Dicot leaf. Any six labels ½ mark each	$\frac{1}{2} \times 6 = 3$	94
22	Define the following: a) Differentiation b) Dedifferentiation c) Redifferentiation. a) Differentiation – the cells derived from meristems and cambium differentiated to perform specific functions is known as differentiation.	$1+1+1=3$	245

	b) Dedifferentiation – regaining the meristematic property in certain conditions by differentiated living tissue. c) Redifferentiation – dedifferentiated tissue once again loose capacity to divide but mature to perform specific functions is known as Redifferentiation. One mark each		
23	Give a brief account on respiratory disorders. Asthma – it is characterized by difficulty in breathing, causing wheezing due to inflammation of bronchi and bronchioles. Emphysema – is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. Occupation respiratory disorders – long exposure to dust working in grinding or stone-breaking industries give rise to inflammation leading to fibrosis results in serious lung damage. One mark each	1+1+1 =3	275 & 276
24	Explain the mechanism of blood clotting. • A clot or coagulation formed mainly of a network of threads called fibrins in which dead and damaged formed elements of blood are trapped. • Fibrins are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin. • Thrombin, in turn is formed from another inactive substance present in the plasma called prothrombin. • An injury or a trauma stimulates the platelets in the blood to release certain factors which activate the mechanism of coagulation. • Certain factors released by the tissues at the site of injury also can initiate coagulation. • Calcium ions play a very important role in clotting. Prothrombin Thrombokinase + Ca⁺⁺ Thrombin (Active) → Fibrinogen Thrombin → Fibrin	3	281
25	Explain the process of ultra filtration. • The first step in urine formation is the filtration of blood, which is carried out by the glomerulus and is called	3	293

	glomerular filtration. - On an average, 1100-1200 ml of blood is filtered by the kidneys per minute. - The glomerular capillary blood pressure causes filtration of blood through 3 layers. - The epithelial cells of Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called filtration slits. - Blood is filtered so finely through these membranes onto the lumen of the Bowman's capsule. Therefore, it is considered as a process of ultra filtration.		
26	Mention three types of cellular movements in human body with an example. <i>Amoeboid movement:</i> Macrophages, leucocytes and Cytoskeletal elements. <i>Ciliary movement:</i> Inner wall of trachea, female reproductive tract. <i>Muscular movement:</i> Limbs, jaws, tongue.	1+1+1 =3	303
PART-D			
27	Write the general characteristics of angiosperms. - They are flowering plants and most advanced and dominant plant of world. - They include dicots and monocots. - The male organ is Stamen. Which produces pollen grains; these germinate and produce male gametophyte. - The female sex organ is pistil; it consists of stigma style and ovary. The egg is present in the embryo sac of the ovule. - These exhibit double fertilization and triple fusion. Any five characters - 1 mark each	1x5=5	
28	Enumerate the features of animals belongs to arthropods. - Arthropod animals have jointed legs. - The body is covered by chitinous exoskeleton. - Body is divisible into head, thorax and abdomen.	1x5=5	53

	- Respiratory organs are gills, book gills, book lungs and tracheal system. - Circulatory system is open type. - Sensory organs are antennae, eyes, and statocyst. - Excretion takes place through malpighian tubules. Any five characters - 1 mark each		
Q No	Answers	Marks	Page No
29	Draw a neat labeled diagram of cockroach male reproductive system.  One label ½ mark each	$\frac{1}{2}$ x10=5	115
30	Describe the structure of chloroplast. Chloroplast containing chlorophyll, caretenoids and helps in photosynthesis. Chloroplast is found in mesophyll tissue of leaves. They may be lens shaped, spherical, discoid and reticulate or ribbon like. It is covered by double membranes. The membrane encloses the stroma containing thylakoids in the grana. Stroma is liquid containing 70S ribosomes and enzymes and double stranded circular DNA. 	5	135-136
31	Name the building blocks of proteins and explain the structural aspects of proteins. - Amino acids. - Primary structure: The amino acids molecules arranged in a linear chain with peptide bond. They exist like rigid rod.	1 1 1	149-150

	• Secondary structure: In this organization the chain is folded. They are folded at right handed side. • Tertiary structure: The protein chain folded one over the other form woolen ball, form three dimensional structure. • Quaternary structure: The polypeptide chain arranged in the form of strings of sphere or may form cube.	1 1	
Q N o	Answers	Marks	Page No
32	Explain the pathway of water movement in root. Apoplast pathway Symplast pathway. Explanation to two pathway- 2.5 marks each.	5	184- 185
33	What are macronutrients? Mention the role of any four macronutrients. Definition: The elements required in large quantity (more than 10 mmol/ kg of dry matter) are called macronutrients. Nitrogen: Phosphorus. Potassium Calcium. Magnesium Mentioning with one role – 1 mark each	1 1 1 1	196- 197
34	Define law of limiting factor. Explain four external factors affecting the rate of photosynthesis. Definition: If a chemical process is affected by more than one factor, then its rate will be determined by the factor which is nearest to its minimal value: it is the factor which directly affects the process if its quantity is changed. Light Carbon dioxide Temperature Water	1 1 1 1	222- 223
35	Write the schematic representation of Glycolysis.	5	229

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36	Draw a neat labeled diagram of sagittal section of human brain. One label ½ mark each	½ x10=5	320
Q N o	Answers	Marks	Page No
37	Name the hormones of adrenal gland and mention their functions. Adrenaline :- Stress hormone Nor-adrenaline :- stress hormone Corticoids: Carbohydrate metabolism. Gluco-corticoids : Gluconeogenesis, lipolysis and proteolysis Aldosterone: Reabsorption of Na⁺, Water, K⁺, Phosphate ions.	1x5=5	335& 336