

SAMPLE QUESTION PAPERS BLUE PRINT FOR I PUC QUESTION PAPER SET -I

UNIT NO	UNIT	TEACHING HOURS	KNOWLEDGE				UNDERSTANDING				APPLICATION/ APPRECIATION				EXPRESSION/ SKILL				TOTAL QUESTIONS				MARKS WEIGHTAGE
	1 ST 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	19	2	1						2									2	3		2	18
II	STRUCTURAL ORGANIZATION IN	17	1	1		1												1	1	2		2	15
III	CELL STRUCTURE AND FUNCTION	19		1	1	1					1								1	1	3	1	17
IV	PLANT PHYSIOLOGY	31	3		1	1			1	1		1		1	1				4	1	2	3	27
V	HUMAN PHYSIOLOGY	34	2	1		1			1	1				1				1	1	3	3		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% weightage per objective 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.

UNIT NO	HOURS	CHAPTER	HOURS	MARKS	KNOWLEDGE			UNDERSTANDING			APPLICATION / APPRECIATION			SKILL			TOTAL			TOTAL MARKS					
I	19				1	2	3	5	1	2	3	5	1	2	3	5	1	2	3	5	MAR KS				
					M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M			
					AR	KS	PE	UR	NI	T															
UNIT I. DIVERSITY OF LIVING ORGANISMS																									
					2	1											2	1			4				
UNIT II.STRUCTURAL ORGANIZATION IN PLANTS ANIMALS																									
II	17				1	1											1				6				
					1	1												2			4				
UNIT III.CELL STRUCTURE AND FUNCTION																									
III	19				8		1										1				8				
UNIT IV.PLANT PHYSIOLOGY																									

31	11. TRANSPORT IN PLANTS	6	2	1														1			3	1		6
	12. MINERAL NUTRITION	6	1																		1	1		8
	13. PHOTOSYNTHESIS IN HIGHER PLANTS	5																						
	14. RESPIRATION IN PLANTS	5																					1	5
	15. PLANT GROWTH AND DEVELOPMENT	5																					1	5
UNIT V. HUMAN PHYSIOLOGY																								
34	16. DIGESTION AND ABSORPTION	3	1	1																	1	1		3
	17. BREATHING AND EXCHANGE OF GASES	3																					1	5
	18. BODY FLUIDS AND CIRCULATION	4																						5
	19. EXCRETORY PRODUCTS AND THEIR ELIMINATION	3																					1	3
	20. LOCOMOTION AND MOVEMENT	4																					1	3
	21. NEURAL CONTROL AND CO-ORDINATION	6	1																				1	6
	22. CHEMICAL CORDINATION AND INTEGRATION	6																					1	3
120	TOTAL	120	88	61																				105

Model Question Paper – 1

SUB: BIOLOGY (36) 1 PUC MODEL QUESTION PAPER SET -I

TIME: 3.15 HRS

MAX MARKS: 70

GENERAL INSTRUCTIONS:

- The question paper consists of four parts A, B, C and D
- All the parts are compulsory
- Draw diagrams wherever necessary. Unlabelled diagrams or illustration do not attract any marks

PART -A

Answer the following questions in one word or one sentence each:

1x 10=10

1. Define metabolism
2. What are taxonomic aids?
3. What is venation?
4. Why does enzyme activity decrease at high temperature?
5. How does diffusion differ from active transport?
6. Define apoplast
7. What is transpiration?
8. What is nitrogen fixation?
9. Define thecodont
10. What is tetany?

PART- B

Answer any five of the following questions in 3-5 sentences each wherever applicable:

2x5=10

11. What is binomial nomenclature? Mention any two taxonomic categories
12. Draw a neat labeled diagram of TMV
13. What are bilateral and radial symmetry?
14. Write any two characters of collenchyma
15. What are radial and conjoint vascular bundles?
16. Write any two features of metaphase
17. How are the mycorrhizal association help in absorption of water and minerals in plants?
18. Name any two cells of gastric glands and their secretions

PART – C

Answer any five of the following questions in 100 - 150 words each:

3x5=15

19. Draw a neat labeled diagram of nucleus
20. What are enzymes? Mention any two types
21. Give the diagrammatic view of cell cycle
22. Define the following terms: a) Antiport b) Plasmolysis c) Imbibition
23. Enlist the criteria for essentiality of mineral nutrients in plants
24. How does haemodialysis help in purifying the blood?
25. Explain the structure of actin filament
26. Mention the physiological effects due to:
 - a) Deficiency of Growth hormone
 - b) Deficiency of iodine
 - c) Deficiency of insulin

PART – D

SECTION – I

Answer any four of the following questions in 200 – 250 words each wherever applicable: 5x4=20

27. Enumerate any five characteristic features of Gymnosperms
28. Draw a neat labeled diagram of male reproductive system of frog
29. Write the functions of :
 - a) i) Chloroplast ii) Cytoskeleton iii) Centrosome
 - b) Enlist the organs involved in endomembrane system
30. Explain the stages of Calvin cycle
31. a) Classify plants based on photoperiodism
- b) Mention any two physiological roles of Gibberellins
32. Explain the mechanism of breathing

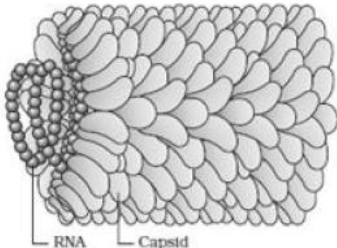
SECTION – II

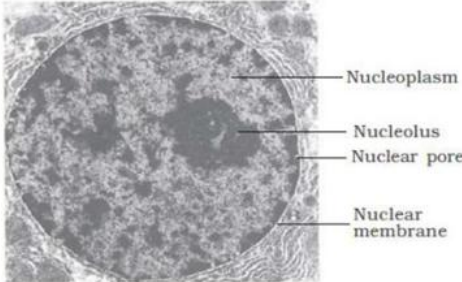
Answer any three of the following questions in 200 – 250 words each wherever applicable: 5x3=15

33. Write any five differences between chondrichthyes and osteichthyes
34. Mention the types of placentation with an example each
35. Explain anaerobic respiration
36. Draw a neat labeled diagram of section of human heart
37. Explain the pathway of reflex action

SUB: BIOLOGY (36) I PUC MODEL QUESTION PAPER SET -I
Scheme of Evaluation

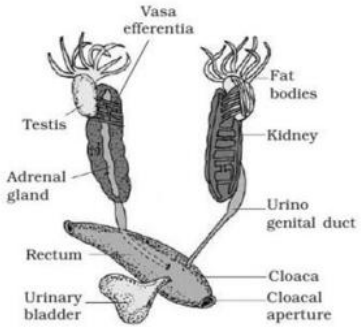
Q. No	VALUE POINTS	Marks Allotted	Page number
	Part – A		
1	Define metabolism Sum total of all the chemical reactions occurring in the cell of an organism	1	5
2	What are taxonomic aids? The tools or devices or procedures used in the study of taxonomy	1	11
3	What is venation? The arrangement of veins and veinlets in the leaf lamina	1	70
4	Why does enzyme activity decrease at high temperature? Due to denaturation of proteins	1	157
5	How does diffusion differ from active transport? Diffusion differ from active transport as it occurs across the gradient and do not require metabolic energy	1	176/178
6	Define apoplast It is a system of adjacent cell walls that is continuous throughout the plant except the casparian strips of the endodermis in the root	1	184
7	What is transpiration? The evaporative loss of water by plants	1	187
8	What is nitrogen fixation? The process of conversion of nitrogen to ammonia	1	201
9	Define thecodont Tooth is embedded in the socket of jaw bone	1	257
10	What is tetany? Rapid spasms in muscle due to calcium in body fluid	1	312
	Part – B		
11	What is binomial nomenclature? Mention any two taxonomic categories The system of providing a name with two components is called binomial nomenclature. Species, genus, family, order, class, division, phylum, kingdom	1 $\frac{1}{2} + \frac{1}{2}$	6/10

	(any two)		
12	Draw a labeled diagram of TMV 	Diagram Labeling $\frac{1}{2}$ each	26
13	What are bilateral and radial symmetry? Bilateral symmetry - The body can be divided into identical left and right halves in only one plane Radial symmetry - The body can be divided into equal halves in any plane passing through the central axis of the body	1 1	47
14	Write any two characters of collenchyma • Cells may be oval, polygonal or spherical • Cellwall is thicker due to deposition of cellulose, hemicellulose and pectin • Intercellular spaces are absent • Cells may have chloroplast	Any two 1 + 1	86
15	What are radial and conjoint vascular bundles? The xylem and phloem within a vascular bundles are arranged in an alternate manner on different radii is called radial vascular bundle The xylem and phloem are situated at the same radius of the vascular bundles is called conjoint	1 + 1	90
16	Write two key features of metaphase • Spindle fibres are attached to kinetochores of chromosomes • Chromosomes are moved to spindle equator and get aligned along metaphase plate through spindle to both poles	1 + 1	165
17	How are the mycorrhizal association help in absorption of water and minerals in plants? The fungal filaments form a network around the young root or	1 + 1	186

	they penetrate the root cells. The hyphae have a very large surface area that helps in the absorption of water and mineral ions from the soil		
18	Name any two cells of gastric glands and their secretions Peptic or chief cells – pepsinogen Parietal or oxyntic cells – HCl Mucus neck cells - mucus	1 1 Any two	262
Part - C			
19	Draw a neat labeled diagram of nucleus 	Diagram 1 Each label $\frac{1}{2}$ Mark	138
20	What are enzymes? Mention any two types Enzymes are the biocatalyst that catalyzes biochemical reactions in the cells. • Oxido-reductases • Transferases • Isomerases • Ligases • Lyases • Hydrolases	1 Any two 1 mark	158/160
22	Define the following terms: a) Antiport b) Plasmolysis c) Imbibition Antiport – When both the molecules cross the membrane in the same direction Plasmolysis – Shrinkage of protoplast due to exosmosis Imbibition – A specialized type diffusion when water is absorbed by solids –colloids causing them to increase in volume	1 mark each	177/181/ 182

23	Enlist the criteria for essentiality of mineral nutrients in plants • Absolutely necessary • Specific and not replaceable • Directly involved in the metabolism	1 Mark each	185
24	How does haemodialysis help in purifying the blood? • In kidney failure patients' urea can be removed by a process called hemodialysis. • Blood drained from a convenient artery is pumped into a dialyzing unit after adding heparin • The unit contains coiled cellophane tubes surrounded by dialyzing fluid having the same composition as that of plasma except nitrogenous wastes • The porous cellophane membrane of the tube allows the passage of the molecules based on the concentration gradient • As nitrogenous wastes are absent in dialyzing fluid, these substances freely move out there by clearing the blood • The purified blood is pumped back through a vein after adding anti-heparin to it	½ mark each	298/299
25	Explain the structure of actin filament • Each actin (thin) filament is made of two 'F' (filamentous) actins helically wound to each other. Each 'F' actin is a polymer of monomeric 'G' (Globular) actins. • Two filaments of another protein, tropomyosin also run close to the 'F' actins throughout its length. • A complex protein Troponin is distributed at regular intervals on the tropomyosin.	I Mark each	306
26	Mention the physiological effects due to: a) Low secretion of growth hormone – Pituitary dwarfism b) Deficiency of iodine – hypothyroidism/ goitre c) Deficiency of insulin – Diabetes mellitus	1 Mark each	332/333/ 336
PART – D (section – I)			

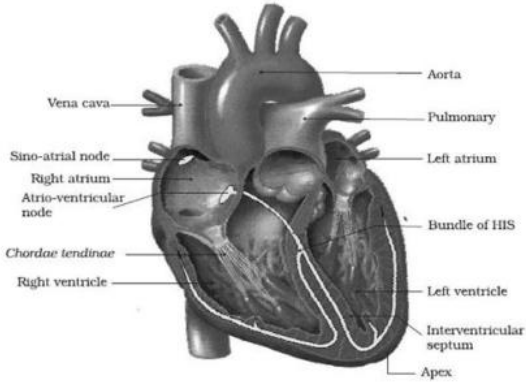
27	Enumerate any five characteristic features of Gymnosperms • The gymnosperms are naked seeded plants • Gymnosperms include medium-sized trees or tall trees and shrubs. • Roots in some genera have fungal association in the form of mycorrhiza (<i>Pinus</i>), while in some others (<i>Cycas</i>) small specialized roots called coralloid roots are associated with N₂-fixing cyanobacteria. • The stems are unbranched (<i>Cycas</i>) or branched (<i>Pinus</i>, <i>Cedrus</i>). • The leaves may be simple or compound. • The leaves in gymnosperms are well-adapted to withstand extremes of temperature, humidity and wind. • In conifers, the needle-like leaves reduce the surface area. • Their thick cuticle and sunken stomata also help to reduce water loss. • The gymnosperms are heterosporous; they produce haploid microspores and megaspores. • The two kinds of spores are produced within sporangia that are borne on sporophylls which are arranged spirally along an axis to form lax or compact strobili or cones. • The strobili bearing microsporophylls and microsporangia are called microsporangiate or male strobili. The microspores develop into a male gametophytic generation which is highly reduced and is confined to only a limited number of cells. • The cones bearing megasporophylls with ovules or megasporangia are called macrosporangiate or female strobili.	1 Mark each Any five	38

28	Draw a neat labeled diagram of male reproductive system of frog 	Diagram 1 mark Each labeling $\frac{1}{2}$ mark	119
29	a) Write the functions of : - Chloroplast – Photosynthesis - Cytoskeleton – Mechanical support/Motility/Maintenance of the cell shape - Centrosome – Spindle apparatus formation during cell division/Basal body of cilia or flagella b) Enlist the organs involved in endomembrane system - Endoplasmic reticulum - Golgi bodies - Lysosomes - Vacuole	1 mark each for a function $\frac{1}{2}$ mark each	133136/ 138
30	Explain the stages of Calvin cycle The Calvin cycle can be described under three stages: carboxylation, reduction and regeneration. 1. Carboxylation – Carboxylation is the fixation of CO₂ into a stable organic intermediate. Carboxylation is the most crucial step of the Calvin cycle where CO₂ is utilised for the carboxylation of RuBP. This reaction is catalysed by the enzyme RuBP carboxylase which results in the formation of two molecules of 3-A. Since this enzyme also has an oxygenation activity it would be more correct to call it RuBP carboxylase-oxygenase or RuBisCO.	1 1 1	216/217

	2. Reduction – These are a series of reactions that lead to the formation of glucose. The steps involve utilisation of 2 molecules of ATP for phosphorylation and two of NADPH for reduction per CO₂ molecule fixed. The fixation of six molecules of CO₂ and 6 turns of the cycle are required for the removal of one molecule of glucose from the pathway. 3. Regeneration – Regeneration of the CO₂ acceptor molecule RuBP is crucial if the cycle is to continue uninterrupted. The regeneration steps require one ATP for phosphorylation to form RuBP.	1	
		1	
31	a) Explain the types of plants based on photoperiodism • Long day plants – the plants in which the flowering requires the exposure of light for a period exceeding a well defined critical duration • Short day plants - the flowering in plants require the exposure of light for a period less than a well defined critical duration • Day-neutral plants - the flower induction occur in these plants irrespective of the critical duration of light exposure b) Mention any two physiological role of Gibberellins • Their ability to cause an increase in length of axis is used to increase the length of grapes stalks. • Gibberellins, cause fruits like apple to elongate and improve its shape. • They also delay senescence. • Thus, the fruits can be left on the tree longer so as to extend the market period. GA₃ is used to speed up the malting process in brewing industry. • Spraying sugarcane crop with gibberellins increases the length of the stem, thus increasing the yield by as much as 20 tonnes per acre. • Spraying juvenile conifers with GAs hastens the maturity	1 Mark each Any two 1 Mark each	251 249

	period, thus leading to early seed production. Gibberellins also promotes bolting (internode elongation just prior to flowering) in beet, cabbages and many plants with rosette habit.		
32	Explain the mechanism of breathing - Breathing involves two stages : inspiration during which atmospheric air is drawn in and expiration by which the alveolar air is released out. - The movement of air into and out of the lungs is carried out by creating a pressure gradient between the lungs and the atmosphere. - Inspiration can occur if the pressure within the lungs (intra-pulmonary pressure) is less than the atmospheric pressure, i.e., there is a negative pressure in the lungs with respect to atmospheric pressure. - Similarly, expiration takesplace when the intra-pulmonary pressure is higher than the atmospheric pressure. - The diaphragm and a specialised set of muscles – external and internal intercostals between the ribs, help in generation of such gradients. - Inspiration is initiated by the contraction of diaphragm which increases the volume of thoracic chamber in the antero-posterior axis. - The contraction of external inter-costal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis. - The overall increase in the thoracic volume causes a similar increase in pulmonary volume. An increase in pulmonary volume decreases the intra-pulmonary pressure to less than the atmospheric pressure which forces the air from outside to move into the lungs, i.e., inspiration. - Relaxation of the diaphragm and the inter-costal muscles returns the diaphragm and sternum to their normal positions and reduce the thoracic volume and thereby the	½ mark each	270/271

	pulmonary volume. • This leads to an increase in intra-pulmonary pressure to slightly above the atmospheric pressure causing the expulsion of air from the lungs, i.e., expiration .		
	PART – D (Section – II)		
33	Write any five differences between chondrichthyes and osteichthyes Chondrichthyes • They are marine animals with streamlined body • Cartilaginous endoskeleton. • Mouth is located ventrally. • Gill slits are separate and without operculum (gill cover) • The skin is covered by minute placoid scales. • Due to the absence of air bladder, they have to swim constantly to avoid sinking. • They are mostly viviparous • Fertilization is internal Osteichthyes • It includes both marine and fresh water fishes • Bony endoskeleton. • Mouth is mostly terminal. • The gills are covered by an operculum on each side. • Skin is covered with cycloid/ctenoid scales. • Air bladder is present which regulates buoyancy. • They are mostly oviparous • Fertilization is external	Any five differences 1 mark each	56/57
34	Mention the types of placentation with an example each • Marginal – Pea, beans, • Axile – China rose/tomato/lemon • Parietal – mustard/Argemone • Free central – Dianthus/Primrose • Basal – Sunflower/Marigold	½ mark for type and ½ mark for an example	75/76
35	Explain anaerobic respiration • In fermentation, say by yeast, the incomplete oxidation of glucose is achieved under anaerobic conditions by sets of reactions where pyruvic acid is converted to CO₂ and ethanol. • The enzymes, pyruvic acid decarboxylase and alcohol dehydrogenase catalyse these reactions. • Other organisms like some bacteria produce lactic acid	1 Mark each	230

	from pyruvic acid. • In animal cells also, like muscles during exercise, when oxygen is inadequate for cellular respiration pyruvic acid is reduced to lactic acid by lactate dehydrogenase. • The reducing agent is $\text{NADH} + \text{H}^+$ which is reoxidised to NAD^+ in both the processes.		
36	Draw a neat labeled diagram of section of human heart 	Diagram 1 Mark $\frac{1}{2}$ Mark for each correct labeling	283
37	Explain the pathway of reflex action The sudden withdrawal of a body part which comes in contact with objects that are extremely hot, cold pointed or animals that are scary or poisonous. The entire process of response to a peripheral nervous stimulation, that occurs involuntarily, i.e., without conscious effort or thought and requires the involvement of a part of the central nervous system is called a reflex action. The reflex pathway comprises at least one afferent neuron (receptor) and one efferent (effector or excitor) neuron appropriately arranged in a series. The afferent neuron receives signal from a sensory organ and transmits the impulse via a dorsal nerve root into the CNS (at the level of spinal cord). The efferent nucuron then carries signals from CNS to the effector. The stimulus and response thus forms a reflex arc.	1 Mark each	322