

BLUE PRINT FOR SUMMATIVE ASSESSMENT (MODEL PAPER-III) SUBJECT: BIOLOGY (36) 2nd year PUC

SL. NO	UNIT	TEACHING HOURS	KNOWLEDGE				UNDERSTANDING				APPLICATION/ APPRECIATION				EXPRESSION/ SKILL				TOTAL QUESTIONS				MARKS
			1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	1M	2M	3M	5M	
	2 ND PUC	120																					
VI	REPRODUCTIVE N	29	2	1			1	2	1	1			1					1	3	3	2	2	25
VII	GENETICS AND EVOLUTION	30	1	1	1		1	1	1					1			1	1	2	2	3	2	25
VIII	BIOLOGY AND HUMAN	25	1			1	1	1	1	1				1					2	1	1	3	22
IX	BIOTECHNOLOGY	12	1			1			1			1							1	1	1	1	11
X	ECOLOGY	24	2		1	3										1			2	1	1	3	22
		120	40 % 42 marks				30% 33 marks				15 % 15marks				15% 15 marks				10	8	8	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

MODEL QUESTION PAPER- SET-III

BIOLOGY II PUC

Time: 3Hours 15Minutes

Maximum Marks:70

Instructions:

- 1.This question paper consist of four parts A,B,C,and D. Part D consist of two sub parts, section I and section II
- 2.All parts are compulsory
- 3.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 life span?
- What is Apomixis?
11. Name the foetal sex determination test.
12. Define alleles.
13. Expand VNTR.
14. What is totipotency.
15. What are bio fertilizers?
16. Define biotechnology
17. Give example for ex-situ conservation
18. Water hyacinth is called terror of Bengal why?

PART – B

Answer any five of the following questions in 3-5 sentence each. Wherever applicable: 5x2=10

11. Distinguish between geitonogamy and xenogamy.
12. Mention the functions of placenta.
13. Name any two assisted reproductive technique..
14. List the characteristic features of genetic code.
15. What are analogous organs? Give two examples.
16. What is interbreeding depression? How is it controlled?
17. Write a short note on biopiracy.
18. Draw a neat diagram of pyramid of number in a grassland ecosystem.

PART – C

Answer any five of the following questions in about 40-80 words each wherever applicable: 5x3=5

19. Write short notes on fertilisation?
20. How do intrauterine devices prevent conception in humans?
21. Mention the causes of Down syndrome and add a note on symptoms.
22. List any three criteria that molecule can act as a genetic material.
23. Draw a labelled diagram of Miller's experiment.
24. Name the causative organism of the following diseases
a) Typhoid b) Malaria c) Elephantiasis.
25. What are genetically modified organisms? Mention their significance.
26. Mention the types of biodiversity.

PART – D SECTION - I

Answer any four of the following questions in about 200-250 words each, wherever applicable: 4x5=20

27. Describe the structure of mature embryo sac.
28. Explain the law of Segregation using monohybrid cross.
29. Explain the structure of antibody.
30. Explain the role of microbes in production of any five industrial products.
31. Explain the structure of pBR322.
32. What is ecology explain major abiotic factor in any ecosystem.

SECTION – II

Answer any three of the following questions in about 200-250 words each, wherever applicable: 3x5=15

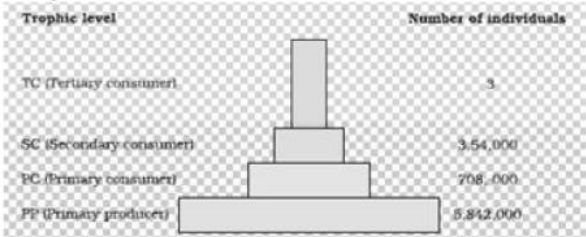
33. Draw a labelled diagram of sectional view of female reproductive system.
34. Explain lac operon concept.
35. Explain the carbon cycle
36. a) Explain the role of dairy farm management in human welfare.
b) Write a note on single cell protein
37. What is global warming? Explain causes and effects of global warming.

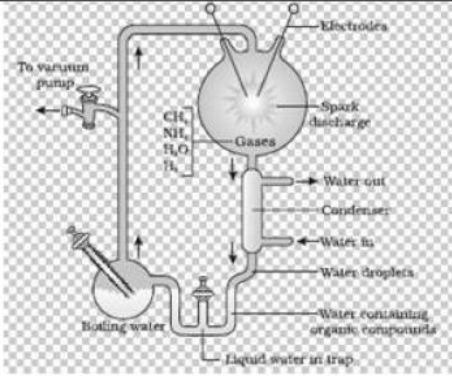
Scheme of Evaluation – Iiyear(SET-III)

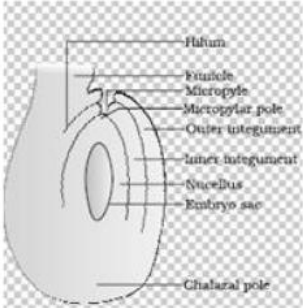
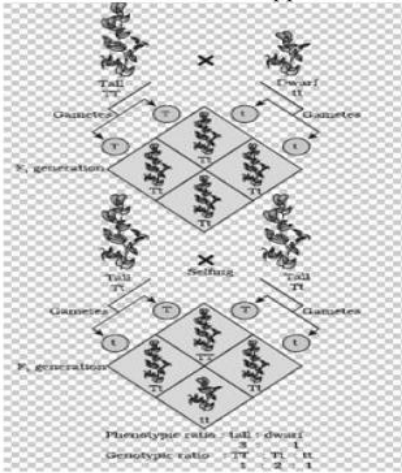
PART-A

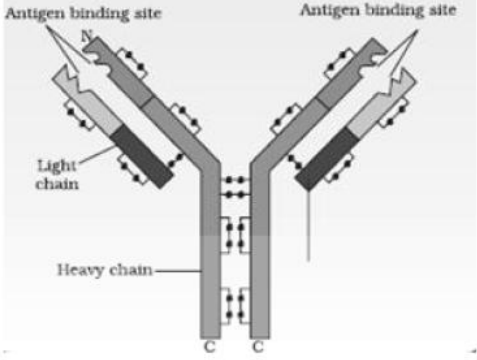
Q No	Answers	Marks	Page No
1 Ans	What is life span? The period from birth to natural death of an organisms	1	3
2 Ans	What is Apomixis? The production of seeds without fertilization	1	38
3 Ans	Name the foetal sex determination test. amniocentesis	1	58
4 Ans	Define alleles. Genes which code for a pair of contrasting traits are known as alleles	1	72
5 Ans	Expand VNTR. Variable number of tandem repeats	1	122
6 Ans	What is totipotency. The capacity to generate a whole plant from any cell/explant	1	177
7 Ans	What are biofertilizers? Biofertilizer are organisms that enrich the nutrient quality of the soil	1	188
8 Ans	Define biotechnology Biotechnology deals with techniques of using live organisms or enzymes to produce products and processes useful to humans. OR The integration of natural science and organisms, cells, parts thereof and molecular analogs for products and services.	1	193
9 Ans	Give example for ex-situ conservation. Zoological parks, Botanical gardens, wild life safari parks.	1	267
10 Ans	Water hyacinth is called terror of Bengal why? They grow abundantly in eutrophic water body leading to misbalancing ecosystem dynamics	1	276
PART – B			
11 Ans	Distinguish between geitenogamy and xenogamy. Transfer of pollengrains from anther to stigma of another flower of the same plant is called geitenogamy. Transfer of pollengrains from anther to stigma of a flower of the different plant is called Xenogamy.	1 1	28
12 Ans	Mention the functions of placenta. Supply oxygen to the foetus supply nutrients to foetus removes carbon dioxide and excretory waste material produced	Any 2	53

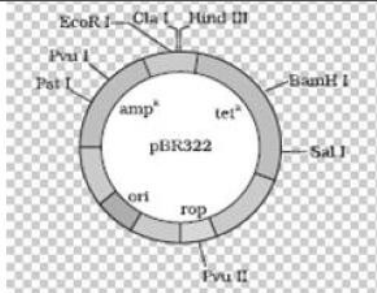
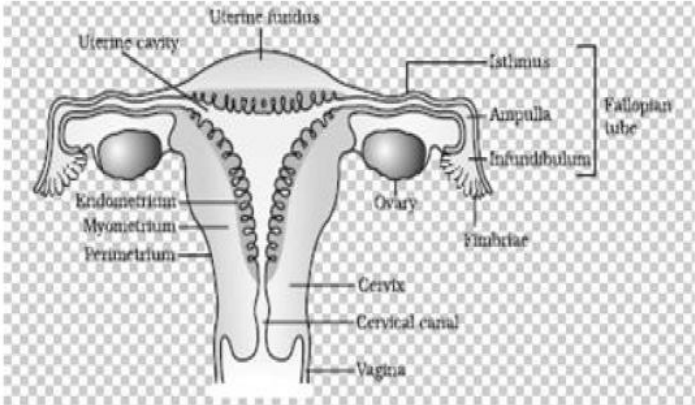
	by the foetus. Produces hormones like hCG,hPL		
13 Ans	Name any two assisted reproductive technique. In-vitro fertilization and embryo transfer – IVF- ET. Zygote intra fallopian transfer-ZIFT. Intra uterine transfer- IUT gamete intra fallopian transfer-GIFT. Intra cytoplasmic sperm injection -ICSI Artificial insemination –AI Intra uterine insemination –IUI	any 2	64
14 Ans	List the characteristic features of genetic code. Codons are triplet in nature gentic code is universal. Redundancy or degeneracy. Specificity or unambiguity or sensibility. Non overlapping or comaleless. Initiator codon AUG Terminator codon UAA, UAC,UAG	any2	113
15 Ans	What are analogous organs? give two examples. Structures that differ in anatomical plane and origin but perform similar functions are called analogous organs. Wings of birds and insects. Eyes of octopus and mammals. Flippers of penguins and dolphins. Tuber of potato and sweet potato.	1 Any 2 1/2each	130 131
16 Ans	What is interbreeding depression? How is it controlled? Continue inbreeding usually reduces fertility and productivity called inbreeding depression. Controlled by Out breeding Out crossing Cross breeding Inter specific hybridization.	1 Mention any 2	167 168
17 Ans	Write a short note on biopiracy. • Biopiracy is the term used to refer to the use of bioresource by the multinational companies and other organizations without proper authorization from the countries and people concerned without compensatory payment. • Most of the industrialized and developed countries are financially rich but poor in the traditional knowledge and biodiversity. • Traditional knowledge related to the bio resources can be exploited to develop modern application and can also be used to save time effort and expenditure during commercialization. • Some nations are developing law to prevent bio piracy.	1 Any 1 point	214

18 Ans	Draw a neat diagram of pyramid of number in a grassland ecosystem. 	2 marks	248
PART – C			
19 Ans	Write short notes on fertilization? The process of fusion of gametes results in the formation of zygote External fertilization the gamatic fusion that occurs in the external medium of water outside the body. Internal fertilisation: syngamy occurs in the body of the organism.	1 1 1	14-15
20 Ans	How do intra uterine devices prevent conception in humans? • Increase phagocytosis of sperms within the uterus. • Cu ions released by them suppress sperm motility and the fertilizing capacity of sperms. • Hormones releasing IUDS make the uterus unsuitable for implantation 1mark each	1 1 1	60
21 Ans	Mention the causes of Down syndrome and add a note on symptoms. Cause- the presence of an additional copy of the chromosome number 21(trisomy of 21) • Short statured with small round head • Furrowed tongue • Partially open mouth. • Palm is broad with characteristic palm crease. • Physical, psychomotor and mental development is retarded	1 1/2X4=2	91
22 Ans	List any three criteria that molecule can acts as a genetic material. 1. It should be able to generate its replica(replication) 2. It should chemically and structurally be stable. 3. It should provide the scope for slow changes (mutation) 4. It should be able to express itself in the form of Mendalian characters	Any 3	103
23 Ans	Draw a labeled diagrammatic representation of Miller's experiment. Miller's experiment diagram	Any 6 labeling	128

			
24 Ans	Name the causative organism of the following diseases a)Typhoid b) Malaria c)Elephantiasis. • Typhoid – <i>Streptococcus pneumonia</i> ▪ <i>Haemophilus influenza</i> • Malaria – <i>Plasmodium vivax</i>, <i>P.malaria</i>, <i>P.falciparum</i> • Elephantiasis – <i>Wucharia bancrofti</i>, <i>Wuchereria malyi</i> Note-If student write only genus name marks should be awarded 1mark each	3	149
25 Ans	What are genetically modified organisms? Mention their significance. • Plants,bacteria,fungi and animals whose genes have been altered by gene manipulation are called genetically modified organisms. Made plants more tolerant to abiotic stress like cold,drought,salt,and heat • Reduced reliance on chemical pesticides – pest resistant crops. • Helped to reduce post harvest losses. • Increase the efficiency of mineral nutrition usage by plants. • Enhance the nutritional value of the food	1 any2x1 =2	208
26 Ans	Mention the types of biodiversity. • Genetic diversity • Species diversity • Ecological diversity 1 mark each. PART – D SECTION - 1	1 mark each.	259
27 Ans	Describe the structure of mature embryo sac • Presence of micropylar and chalazal region • Micropylar region consist of egg apparatus with egg cell and two synergids • Synergids consist of filiform apparatus • Chalazal region consist of three antipodal cells	3	24 25 26

	- In the central region there is a secondary diploid cell - Egg cell synergids and antipodal cells are haploid 		
28 Ans	Explain the law of Segregation using monohybrid cross. - Statement: The alleles do not show any blending and two alleles during gamete formation segregate each other such that every gamete receives only one of the two factors. Mendel crossed tall and dwarf pea plants to study inheritance of one gene. - Only one of the parental trait tall appeared in F₁ generation. - F₁ tall plant was allowed to undergo self pollination. - In F₂ both traits appeared in 3 tall and 1 dwarf ratio. 	1 1 2 1	75
29 Ans	Explain the structure of antibody. - Antibody molecule has four polypeptide chain - Two small chains called light chain and two longer chains called heavy chains	3	151

	• Antibody molecule is H₂L₂ • The light chain and heavy chain are attached with disulphide bridges • Antibody molecule consist of antigen binding site. 		
30 Ans	Explain the role of microbes in production of any five industrial products 1. Fermented beverages: wine beer, whisky, brandy have been produced by yeast. 2. Antibiotics: Antibiotics like penicillin produced from <i>Penicillium notatum</i>. 3. Chemicals: Organic acids are produced in the following way: Citric acid <i>Aspergillusniger</i>, Acetic acid <i>Acetobacteraceti</i>, butric acid – <i>Clostridium butilecum</i>, lactic acid- <i>Lactobacillus</i> 4. Enzymes – lipases used in laundry Pectinases use to purify the bottled fruit juices 5. Bio active molecules – cyclosporine A – <i>Trichoderma polysporum</i> immunosuppressent agent. Statins – <i>Monoscus purpureus</i> used to reduce cholesterol level in the body	mention ing 5names 2.5mark s mention ing 5applica tions 2.5mark s	
31 Ans	Explain the structure of pBR322. • pBR322 consist of a strong origin called ori • consist of rop gene that code for the protein involved in replication of the plasmid. • It consist of ampicilin and tetracycline resistance gene. • Ampiciline resistant gene consist of restriction site for REN-PstI and PvuI. • Tetracycline resistant gene consist of restriction site for REN-BamHI, SalI. • pBR322 also consists of restriction sites for REN-EcoRI, ClaI, HindIII.	3	199

		diagram 2	
32 Ans	What is ecology? explain major abiotic factor in any ecosystem. - Ecology is the study of interactions among different organisms and between the organisms and their physical or a biotic environment 1mark - Mentioning light, temperature, water, and soil - Explanation of each factor	1 $1/2 \times 4 = 2$ $1/2 \times 4 = 2$	221-223
	SECTION - II		
33 Ans	Draw a labeled diagram of sectional view of female reproductive system. 	Neat diagram 1mark Any 8labellings	
34 Ans	Explain lac operon concept. - Consists of of regulatory genes, lac ZYA - Control genes consist of promoter. Between promoter and structural genes is the operator. - Regulatory gen lac I codes for reprerssor, which binds to operator and switches of lac operon. - When glucose not available, lactose available lactose enters <i>E. coli</i> and binds inducer and forms inducer repressor complex that freee the operator - RNA polymerase will transcribe the structural gene	3	116 -118

	produce polycistronic mRNA now lac operon is switched on. Polycistronic mRNA is translated into three enzymes beta galactosidase –by lacZ, betagalactosidepermease – by lacY and betagalactosidetransacetylase – by lacA	Diagram 2mark	
35 Ans	Explain the carbon cycle Fossil fuel represent reservoir of carbon It occurs through atmosphere ocean and through living and dead organisms It is estimated that 4×10^{13} kg of carbon is fixed in biosphere through photosynthesis annually. Considerable amount of carbon returns to the atmosphere as carbon dioxide through respiratory activities of produces and consumers Decomposers also contribute carbon dioxide Rapid deforestation and massive burning of fossil fuel, forest fire and volcanic activities forms additional sources of carbon dioxide the atmosphere Some amount of fixed carbon is lost to the sediment and removed from the circulation. The atmosphere carbon is fixed during photosynthesis.	Any 5	245
36 Ans	a) Explain the role of dairy farm management in human welfare. b) Select good breeds of high yield, high resistance to diseases. c) Look after the cattle properly with well house.	any 3 3	166

	d) Provide adequate water of good quality. e) Feed scientifically with good quality food. f) Keep the dairy farm clean g) Maintain hygiene of cattle and handler h) As far as possible mechanized the practices b) Write a note on single cell protein Protein produced by metabolism of single cells like <i>Methylophilus methalotrophus</i> or spirulina is called single cell protein. 250gm of microbe is known to produce 25tones of proteins in a day. It can be easily grown on waste water coming out of potato processing unit or sewage. It is a rich source of protein for human and animal consumption.	2	176
37 Ans	What is global warming? Explain causes and effects of global warming. Increase in the average temperature of the earth due to increase in concentration of green house gases like carbon dioxide, methane, water vapour, chlorofluro carbon is called global warming. Causes: burning of the fossil fuel. Deforestation Effects-change in environment due to Elnino effect leading to change drought and rain pattern. Melting of polar ice caps leading to increase in sea level. Mentioning two cause and two effect 2marks Explaining two causes and two effects 2marks	1 2 2	282