### DEPARTMENT OF PRE UNIVERSITY EDUCATION

### MODEL QUESTION PAPER

#### **BIOLOGY (36)**

# II PUC DISTRIBUTION OF MARKS-CHAPTER-WISE

2022-23

| Unit<br>No | Unit<br>Wise<br>Hours | Unit<br>Wise<br>Marks | Chapter<br>No | Chapters                                      | Chapter<br>Wise<br>Hours                          | Chapter<br>Wise<br>Marks |  |  |  |  |  |  |  |
|------------|-----------------------|-----------------------|---------------|---|---|--------------------------|--|--|--|--|--|--|--|
|            |                       |                       | 1             | Reproduction in organisms                     | 5   | 5                        |  |  |  |  |  |  |  |
| VI         | 29                    | 28                    | 2             | Sexual reproduction in flowering plants       | 10  | 9                        |  |  |  |  |  |  |  |
| V1         | 29                    | 20                    | 3             | Human reproduction                            | 9   | 9                        |  |  |  |  |  |  |  |
|            |                       |                       | 4             | Reproductive health                           | 5   | 5                        |  |  |  |  |  |  |  |
|            |                       |                       | 5             | Principles of inheritance and variation       | 12  | 11                       |  |  |  |  |  |  |  |
| VII        | 30                    | 28                    | 6             | Molecular basis of inheritance                | 12  | 11                       |  |  |  |  |  |  |  |
|            |                       |                       | 7             | Evolution                                     | 6   | 6                        |  |  |  |  |  |  |  |
|            |                       |                       | 8             | Human health and disease                      | 10  | 9                        |  |  |  |  |  |  |  |
| VIII       | 25                    | 24                    | 9             | Strategies for enhancement in food production | 9   | 9                        |  |  |  |  |  |  |  |
|            |                       |                       | 10            | Microbes in human welfare                     | 6   | 6                        |  |  |  |  |  |  |  |
| IX         | 12                    | 12                    | 11            | Biotechnology-principles and processes        | 7   | 7                        |  |  |  |  |  |  |  |
|            | 12                    | 12                    | 12            | Biotechnology and its applications            | 5   | 5                        |  |  |  |  |  |  |  |
|            |                       |                       | 13            | Organisms and populations                     | 7   | 7                        |  |  |  |  |  |  |  |
| X          | 24                    | 23                    | 14            | Ecosystem                                     | 6½  | 6                        |  |  |  |  |  |  |  |
| Λ          | 24                    | 23                    | 15            | Biodiversity and conservation                 | 31/2  | 3                        |  |  |  |  |  |  |  |
|            |                       |                       | 16            | Environmental issues                          | 7   | 7                        |  |  |  |  |  |  |  |
|            | 120                   | 115                   |               |   | 120   | 115                      |  |  |  |  |  |  |  |
| Kn         | owledge =             | 40% (46 n             | narks)        | Easy = 40%                                    | 1 mark = 20 questions                             |                          |  |  |  |  |  |  |  |
| Un         | derstandin            | ng = 30% (3)          | 35 marks)     | Average = 40%                                 | 2 marks = 08 questions                            |                          |  |  |  |  |  |  |  |
| Ap         | plication =           | = 15% (17             | marks)        | Difficult = 20%                               | 3 marks =   | 3 marks = 08 questions   |  |  |  |  |  |  |  |
| Sk         | ill = 15% (           | (17 marks)            |               | Total questions = 47                          | <b>Total questions = 47</b> 5 marks = 11 question |                          |  |  |  |  |  |  |  |

### BLUE PRINT MODEL QUESTION PAPER II PUC- BIOLOGY (36)

2022-23

#### **UNIT-WISE WEIGHTAGE**

| UNIT<br>NO | UNITS                    | TEACHING<br>HOURS | KNOWLEDGE |                |    |    | UNE            | DERS | ΓANI | DING           |    |    | TION<br>(ATIC |                |    | PRES<br>SKII | SION<br>L | 1/ | (  | TO:<br>QUES |    | MARKS<br>WEIGHTAGE |    |
|------------|--------------------------|-------------------|-----------|----------------|----|----|----------------|------|------|----------------|----|----|---------------|----------------|----|--------------|-----------|----|----|-------------|----|--------------------|----|
|            |                          |                   | 1M        | 2M             | 3M | 5M | 1M             | 2M   | 3M   | 5M             | 1M | 2M | 3M            | 5M             | 1M | 2M           | 3M        | 5M | 1M | 2M          | 3M | 5M                 |    |
| VI         | REPRODUCTION             | 29                | 6         | 2              | 1  |    |                | 1    | 1    | 1              |    |    |               |                |    |              |           | 1  | 6  | 3           | 2  | 2                  | 28 |
| VII        | GENETICS AND EVOLUTION   | 30                | 4         | 2              | 1  |    |                | 1    |      | 1              |    |    |               | 1              |    | 1            | 1         |    | 4  | 4           | 2  | 2                  | 28 |
| VIII       | BIOLOGY IN HUMAN WELFARE | 25                | 1         |                |    | 2  | 1              |      |      | 1              | 1  |    | 2             |                |    |              |           |    | 3  |             | 2  | 3                  | 24 |
| IX         | BIOTECHNOLOGY            | 12                | 1         |                |    |    |                |      |      | 1              |    |    |               | 1              | 1  |              |           |    | 2  |             |    | 2                  | 12 |
| X          | ECOLOGY                  | 24                | 2         |                | 1  | 1  | 2              |      |      | 1              |    |    |               |                | 1  | 1            | 1         |    | 5  | 1           | 2  | 2                  | 23 |
|            |                          | 120               | 40        | 40% (46 MARKS) |    |    | 30% (35 MARKS) |      |      | 15% (17 MARKS) |    |    |               | 15% (17 MARKS) |    |              |           | 20 | 8  | 8           | 11 | 115                |    |

#### NOTE:

- 1. The question paper must be prepared based on the individual blueprint 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 115 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+1/1+1+1+1), the sub-questions have to be derived from the same chapter. One of the 5 marks questions should be subdivided into 5 questions carrying 1 mark each.
- 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. Skill-based questions should not expect descriptive answers.
- 8. MCQs and fill-in-the-blank type of questions should be simple and straightforward.

### BLUE PRINT MODEL QUESTION PAPER II PUC- BIOLOGY (36)

### **CHAPTER-WISE WEIGHTAGE**

2022-23

| Unit<br>No | Total hours | Chapter<br>No | · (.AAPIFR)                                   |      | CHAPTERS Hours KN |              |        | KNOWLEDGE UNDERSTANDING |        |        |        |        |                | APPLICATION |        |        |                |        | ILL    |        | To     | tal Qı | uestio | ns     | Chapter       | Unit          |
|------------|-------------|---------------|---|------|-------------------|--------------|--------|-------------------------|--------|--------|--------|--------|----------------|-------------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|---------------|---------------|
|            |             |               |   |      | 1<br>M            | 2<br>M       | 3<br>M | 5<br>M                  | 1<br>M | 2<br>M | 3<br>M | 5<br>M |                | 2<br>M      | 3<br>M | 5<br>M | 1<br>M         | 2<br>M | 3<br>M | 5<br>M | 1<br>M | 2<br>M | 3<br>M | 5<br>M | wise<br>marks | wise<br>marks |
|            |             | 1             | Reproduction in organisms                     | 5    | 1                 | 1            |        |                         |        | 1      |        |        |                |             |        |        |                |        |        |        | 1      | 2      |        |        | 5             |               |
| VI         | 29          | 2             | Sexual reproduction in flowering plants       | 10   | 2                 | 1            |        |                         |        |        |        | 1      |                |             |        |        |                |        |        |        | 2      | 1      |        | 1      | 9             | 28            |
|            |             | 3             | Human reproduction                            |      | 1                 |              | 1      |                         |        |        |        |        |                |             |        |        |                |        |        | 1      | 1      |        | 1      | 1      | 9             | 20            |
|            |             | 4             | Reproductive health                           | 5    | 2                 |              |        |                         |        |        | 1      |        |                |             |        |        |                |        |        |        | 2      |        | 1      |        | 5             |               |
|            |             | 5             | Principles of inheritance and variation       | 12   | 2                 |              |        |                         |        | 1      |        |        |                |             |        | 1      |                | 1      |        |        | 2      | 2      |        | 1      | 11            |               |
| VII        | 30          | 6             | Molecular basis of inheritance                | 12   | 1                 | 1            | 1      |                         |        |        |        | 1      |                |             |        |        |                |        |        |        | 1      | 1      | 1      | 1      | 11            | 28            |
|            |             | 7             | Evolution                                     | 6    | 1                 | 1            |        |                         |        |        |        |        |                |             |        |        |                |        | 1      |        | 1      | 1      | 1      |        | 6             |               |
|            |             | 8             | Human health and disease                      | 10   | 1                 |              |        | 1                       |        |        |        |        |                |             | 1      |        |                |        |        |        | 1      |        | 1      | 1      | 9             |               |
| VIII       | 25          | 9             | Strategies for enhancement in food production | 9    |                   |              |        |                         |        |        |        | 1      | 1              |             | 1      |        |                |        |        |        | 1      |        | 1      | 1      | 9             | 24            |
|            |             | 10            | Microbes in human welfare                     | 6    |                   |              |        | 1                       | 1      |        |        |        |                |             |        |        |                |        |        |        | 1      |        |        | 1      | 6             |               |
| IX         | 12          | 11            | Biotechnology: Principles and processes       | 7    | 1                 |              |        |                         |        |        |        | 1      |                |             |        |        | 1              |        |        |        | 2      |        |        | 1      | 7             | 12            |
| IX         | 12          | 12            | Biotechnology and its applications            | 5    |                   |              |        |                         |        |        |        |        |                |             |        | 1      |                |        |        |        |        |        |        | 1      | 5             | 12            |
|            |             | 13            | Organisms and populations                     | 7    |                   |              |        |                         | 1      |        |        | 1      |                |             |        |        | 1              |        |        |        | 2      |        |        | 1      | 7             |               |
|            |             | 14            | Ecosystem                                     | 6½   | 2                 |              |        |                         | 1      |        |        |        |                |             |        |        |                |        | 1      |        | 3      |        | 1      |        | 6             | 23            |
| Х          | 24          | 15            | Biodiversity and conservation                 | 31/2 |                   |              | 1      |                         |        |        |        |        |                |             |        |        |                |        |        |        |        |        | 1      |        | 3             | 23            |
|            |             | 16            | Environmental issues                          | 7    |                   |              |        | 1                       |        |        |        |        |                |             |        |        |                | 1      |        |        |        | 1      |        | 1      | 7             |               |
|            | 120         |               | Total Questions                               | 120  | 14                | 4            | 3      | 3                       | 3      | 2      | 1      | 5      | 1              |             | 2      | 2      | 2              | 2      | 2      | 1      | 20     | 8      | 8      | 11     | 115           | 115           |
|            |             |               | OBJECTIVE WEIGHTAGE                           |      | 409               | % <b>(46</b> | MARI   | (S)                     | 309    | % (35  | MARI   | (S)    | 15% (17 MARKS) |             |        |        | 15% (17 MARKS) |        |        |        |        |        |        |        |               |               |

## DEPARTMENT OF PRE UNIVERSITY EDUCATION MODEL QUESTION PAPER - 2022-23

### II PUC

SUB: BIOLOGY (36)

| TIME: 3 HOURS 15 MINUTES  | MAX. MARKS: 70            |
|---|---------------------------|
| General instructions:   |                           |
| <ol> <li>The question paper consists of four parts A, B, C, and D.</li> <li>PART-A consists of I &amp; II and Part-D consists of V &amp; VI.</li> </ol> |                           |
| 3. All the parts are compulsory.  |                           |
| <ol> <li>Draw diagrams wherever necessary, unlabelled diagrams or illustra<br/>marks.</li> </ol>  | ations do not attract any |
| PART- A   |                           |
|   |                           |
| I. Select the correct alternative from the choices given below:   | $1 \times 15 = 15$        |
| 1. Which of the following organism exhibits oestrous cycle?   |                           |
| a) Monkey b) Human c) Rat d) Apes   |                           |
| 2. Triploid condition is observed in  |                           |
| a) Egg cell b) Synergid c) Antipodals d) Primary endosperm r  | nucleus                   |
| 3. The first movements of the foetus are observed during which mont   | h of the pregnancy?       |
| a) First month b) Second month c) Fifth month d) Sixth mo   | onth                      |
| 4. An example for non-medicated IUD is  |                           |
| a) Cu-T b) Lippes loop c) LNG-20 d) Multiload 375   |                           |
| 5. Appearance of autosomal recessive trait results in a condition calle   | d                         |
| a) Phenylketonuria b) Turners'syndrome c) Haemophila d) Col   | our blindness             |
| 6. Biopsy is useful in the detection of   |                           |
| a) Typhoid b) Cancer c) AIDS d) Allergy   |                           |
| 7. Biofortified bitter gourd is enriched with   |                           |
| a) Vitamin A b) Protein c) Vitamin C d) Iron  |                           |
| 8. A typical example for mycorrhiza forming fungus is   |                           |
| a) Penicillium b) Aspergillus c) Trichoderma d) Glomus  |                           |
| 9. Select the correct sequence of steps in polymerase chain reaction:   |                           |
| a) Annealing → Denaturation → Extension   |                           |
| b) Denaturation → Annealing → Extension   |                           |
| c) Annealing Extension Denaturation   |                           |
| d) Denaturation → Extension → Annealing   |                           |

| 10. In the equation $GPP-R = NPP$ , the letter 'R' denotes                                    |
|---|
| a) Respiratory quotient b) Respiration loss   |
| c) Intrinsic rate of natural increase d) Regression coefficient                               |
| 11. Medical termination of pregnancies are considered relatively safe during                  |
| a) First trimester of pregnancy b) Second trimester of pregnancy                              |
| c) Third trimester of pregnancy d) Eighth month of pregnancy                                  |
| 12. A disorder characterized by trisomy of 21 is  |
| a) Down's syndrome b) Haemophila c) Thalassemia d) Cystic fibrosis                            |
| 13. The process of degradation of detritus into simpler inorganic substances by bacterial and |
| fungal enzymes is   |
| a) Fragmentation b) Leaching c) Catabolism d) Humification                                    |
| 14. Desert lizards bask in the sun when their body temperature drops below the comfort zone   |
| and move into shade when ambient temperature starts increasing. This is an example for        |
| a) Morphological adaptation b) Behavioural adaptation   |
| c) Physiological adaptation d) Biochemical adaptation   |
| 15. Each tropic level has certain mass of living material at a particular time called as      |
| a) Standing state b) Standing crop c) Biomass d) Productivity                                 |
|   |
| II. Fill in the blanks by choosing the appropriate word/words from those given below:         |
| (Saltation, Pioneer species, Tapetum, $\beta$ -galactosidase, Retrovirus) 1 x 5 = 5           |
| 16. The commonly used vector for cloning genes in animals is                                  |
| 17. The species that invade bare areas are called   |
| 18. The tissue that nourishes the developing pollen grains is                                 |
| 19. In <i>lac</i> operon, the 'z' gene codes for  |
| 20. A single-step large mutation that causes speciation is                                    |
| PART-B  |
| III. Answer any <u>FIVE</u> of the following questions in 3-5 sentences each, wherever        |
| applicable: $2 \times 5 = 10$   |
| 21. What is parthenogenesis? Give an example.   |
| 22. Define a) Emasculation b) Bagging   |
| 23. List the criteria for a molecule that can act as genetic material.                        |
| 24. What are homologous organs? Give an example.  |
| 25. Differentiate between seasonal breeders and continuous breeders.                          |

- 26. Distinguish between linkage and recombination.
- 27. Draw the pedigree symbols for: a) Affected male individual b) Mating between relatives.
- 28. Sketch and label a scrubber used in controlling air pollution.

#### PART - C

## IV. Answer any <u>FIVE</u> of the following questions in about 40-80 words each, wherever applicable: $3 \times 5 = 15$

- 29. What is placenta? Name the hormones secreted by it.
- 30. Explain natural methods for birth control.
- 31. Mention the different steps involved in DNA fingerprinting.
- 32. Draw a labelled diagram of Stanley Miller's apparatus.
- 33. Describe any three barriers of innate immunity with examples.
- 34. a) Why meristerm is preferred in tissue culture as explant? (1)
  - b) Mention the objectives of plant breeding. (2)
- 35. a) Define endemism. (1)
  - b) "Over-exploitation of natural resources by humans resulted in the extinction of many species in the last 500 years". List any two examples for this.
- 36. Schematically represent phosphorous cycling in a terrestrial ecosystem.

#### PART- D

## V. Answer any <u>THREE</u> of the following questions in about 200-250 words each, wherever applicable: $5 \times 3 = 15$

- 37. Describe the structure of a mature female gametophyte in angiosperms.
- 38. Explain any five features of genetic code.
- 39. Explain the different steps involved in the development of a new genetic variety of crop plant.
- 40. Mention the roles played by microbes in household products.
- 41. Explain the process of separation and isolation of DNA fragments using gelelectrophoresis.
- 42. Define the following:
  - a) Biochemical oxygen demand b) Eutrophication c) Biomagnification
  - d) Algal bloom e) Ecological sanitation

## VI. Answer any <u>TWO</u> of the following questions in about 200-250 words each, wherever applicable: $5 \times 2 = 10$

- 43. Draw a sectional view of the human male reproductive system.
- 44. Explain the benefits of transgenic animals for humans.
- 45. In Mendel's experiment, when two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of other pair of characters. Justify this by representing schematically the two gene inheritance.
- 46. a) Differentiate between euryhaline animals and stenohaline animals. (2)
  - b) Describe sexual deceit in *Ophrys*. (3)
- 47. List out the measures used for prevention and control of alcohol and drugs abuse among adolescents.