## DEPARTMENT OF PRE UNIVERSITY EDUCATION MODEL QUESTION PAPER - 2022-23 II PUC SUB: BIOLOGY (36)

#### **TIME: 3 HOURS 15 MINUTES**

#### **General instructions:**

- 1. The question paper consists of four parts A, B, C, and D.
- 2. PART-A consists of I & II and Part-D consists of V & VI.
- **3.** All the parts are compulsory.
- **4.** Draw diagrams wherever necessary, unlabelled diagrams or illustrations do not attract any marks.

#### PART- A

#### I. Select the correct alternative from the choices given below: $1 \ge 15 = 15$

- 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 nucleus
- 3. The first movements of the foetus are observed during which month of the pregnancy?a) First month b) Second month c) Fifth month d) Sixth month
- 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 calleda) Phenylketonuria b) Turners'syndrome c) Haemophila d) Colour 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  $\longrightarrow$  Denaturation  $\longrightarrow$  Extension
  - b) Denaturation  $\longrightarrow$  Annealing  $\longrightarrow$  Extension
  - c) Annealing  $\longrightarrow$  Extension  $\longrightarrow$  Denaturation
  - d) Denaturation  $\longrightarrow$  Extension  $\longrightarrow$  Annealing

#### MAX. MARKS: 70

- 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 *lac* 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:

 $2 \ge 5 = 10$ 

- 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:

 $3 \ge 5 = 15$ 

- 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.(2)

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: $5 \ge 3 = 15$

- 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: $5 \ge 2 = 10$

- 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.