



**SECOND YEAR HIGHER SECONDARY
MODEL EXAMINATION, FEBRUARY - 2024**

Part - III
BIOLOGY

(Botany & Zoology)

Maximum : 60 scores

Time : 2 Hours

Cool-off time : 15 Minutes

Preparatory Time : 10 Minutes

General Instructions to Candidates :

- There is a 'Cool-off time' of 15 minutes in addition to the writing time. Further there is a '10 minutes' 'Preparatory Time' at the end of the Botany Examination and before the commencement of Zoology Examination.
- Use the 'Cool-off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- Read the instructions carefully.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non-programmable calculators are not allowed in the Examination Hall.

വിദ്യാർത്ഥികൾക്കുള്ള പൊതുനിർദ്ദേശങ്ങൾ :

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിറ്റ് 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടുതൽ ബോട്ടനി പരിക്ഷയ്ക്കുശേഷം സുവോളജി പരിക്ഷ തുടങ്ങുന്നതിനുമുമ്പ് '10 മിനിറ്റ്' തയ്യാറെടുപ്പുകൾ നടത്തുന്നതിനായി നല്കുന്നതാണ്. ഈ വേളകളിൽ ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാനോ, മറ്റുള്ളവരുമായി ആശയ വിനിമയം നടത്താനോ പാടില്ല.
- 'കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- നിർദ്ദേശങ്ങൾ മുഴുവനും ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നല്കിയിട്ടുണ്ട്.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരിക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

PART - A

BOTANY

(Maximum : 30 scores)

Time : 1 Hour

- I. Answer any 3 questions from 1 to 4. Each carries 1 score.

(3 × 1 = 3)

Choose the correct answer :

1. Removal of anthers from flower-bud before the anthers dehisces using a pair of forceps. (Bagging, Hybridization, Emasculation, Re-bagging)
2. GPP - R = NPP, what does R stands for ?
3. Which enzymes are known as 'molecular scissors' ?
4. Name the first transgenic cow that produce human protein enriched milk.

- II. Answer any 9 questions from 5 to 15. Each carries 2 scores.

(9 × 2 = 18)

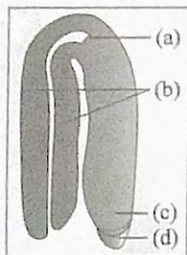
5. Identify the given figure and label the parts given below :

Plumule

Cotyledons

Radicle

Root cap



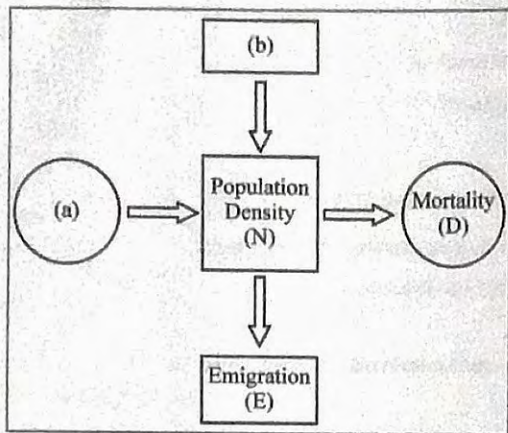
6. Self-incompatibility is an out-breeding mechanism seen in plants. Define self-incompatibility.
7. What are the climatic factors affecting decomposition ?

8. (a) What is gel-electrophoresis ?
(b) Name commonly used matrix in gel-electrophoresis.
9. Write short notes on :
(a) Micro injection
(b) Biolistics
10. Observe the equation $\frac{dN}{dt} = rN \left(\frac{K - N}{K} \right)$
(a) What do N, r, K stands for ?
(b) Define 'K'.
11. Define Gause's competition exclusion principle.
12. (a) What is primary productivity ?
(b) What are the factors affecting primary productivity ?
13. (a) What are transgenic animals ?
(b) Mention two uses of transgenic animals.
14. A list of organisms is given below, arrange them in appropriate trophic levels :
Lion, cow, wolf, trees
1st Trophic level
2nd Trophic level
3rd Trophic level
4th Trophic level
15. (a) Expand GEAC.
(b) Mention its aim.

III. Answer any 3 questions from 16 to 19. Each carries 3 scores.

(3 × 3 = 9)

16. Given below is a schematic representation which shows the factors influencing population density.



- (i) Label (a) and (b).
(ii) Define mortality.
17. (a) Define Pollination.
(b) Insect Pollinated flowers have many peculiarities. Write down any four such peculiarities.
18. (a) Expand PCR.
(b) What are the three steps involved in PCR ?
(c) What are primers ?
19. (a) What is gene therapy ?
(b) How ADA deficiency disorder occurs ?
(c) Suggest a treatment method to give ADA deficiency.

- I. Answer any 3 questions from 1 to 5. Each carries 1 score.

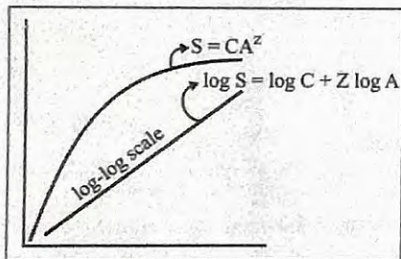
(3 × 1 = 3)

1. Complete the table.

(Hint : Griffith's transformation experiment)

Procedure	Result
S strain bacteria → inject into mice	Mice die
R strain bacteria → inject into mice	(a)
S strain bacteria (Heat Killed) → inject into mice	Mice live
S strain bacteria (Heat Killed) + R strain bacteria (live) → inject into mice	(b)

2. Observe the graph and answer the question.



What does this graph represent ?

3. In female, ovum is normally released on the 14th day of menstrual cycle.

(a) Name the process of release of ovum from ovary.

(½)

(b) Where does fertilisation occur ?

(½)

4. In a particular monohybrid cross, both phenotypic and genotypic ratio was found to be 1 : 2 : 1. Identify this phenomenon.

5. Find out the odd one and justify your answer. ($\frac{1}{2} \times 2 = 1$)

Periodic abstinence, Coitus interruptus, IUD's, Lactational amenorrhoea

- II. Answer any 9 questions from 6 to 16. Each carries 2 scores. ($9 \times 2 = 18$)

6. Infertility cases are increasing now-a-days. These couples should be assisted to have children through certain special techniques which are commonly known as ART.

(a) What is the expansion of ART? (1)

(b) Name any 2 methods in ART. ($\frac{1}{2} \times 2 = 1$)

7. Give 1 example for each of the following :

(a) Inborn error of metabolism. (1)

(b) Sex linked recessive disease in which blood clotting is affected. (1)

8. Identify the given symbols used in pedigree charts. ($\frac{1}{2} \times 4 = 2$)



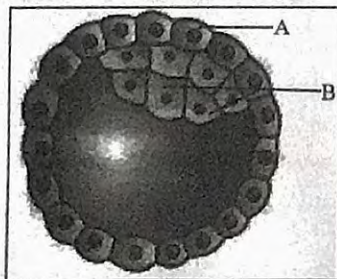
9. Note the relationship between the first two words and fill the missing word :

(a) YAC : Yeast Artificial Chromosome; BAC : _____ (1)

(b) DNA \longrightarrow mRNA : Transcription ; mRNA \longrightarrow Protein : _____ (1)

10. "Prevention is better than cure." Can you suggest any 2 preventive measures for AIDS ?

11. Given below is the diagrammatic representation of human blastocyst. Observe the diagram and answer the following questions :



(a) Identify A and B. ($\frac{1}{2} + \frac{1}{2}$)

(b) Write the functions of A and B. ($\frac{1}{2} + \frac{1}{2}$)

12. Complete the table.

(a)	44A + XO	(b)
Klinefelter's syndrome	(c)	Sterile male
(d)	Trisomy 21	Mental retardation

13. Arrange these in chronological order :

Homo habilis, Homo erectus, Australopithecines, Neanderthal man

14. Match the following :

A	B
Physical barrier	Interferon
Physiological barrier	PMNL
Cellular barrier	Skin
Cytokine barrier	Acid in stomach

15. Sum total of all the allelic frequencies in a population is 1.

(a) Name the principle behind this.

(½)

(b) List any 3 factors which lead to a deviation of allelic frequencies from 1. (½+½+½)

16. Some bioactive molecules, their source and medical importance are given in the table. Fill up the missing parts.

Bioactive Molecule	Source	Medical Importance
(a)	Streptococcus	Removes clot from blood vessels
Cyclosporin A	(b)	(c)
(d)	Monascus purpureus	Blood cholesterol lowering agent

III. Answer any 3 questions from 17 to 20. Each carries 3 scores.

(3 × 3 = 9)

17. "Accelerated rates of species extinctions that the world is facing now is largely due to human activities."

(a) Name the 'evil quartet' (4 major causes) of biodiversity loss.

(2)

(b) Write any 2 ex-situ methods to conserve biodiversity.

(1)

18. Diagram shown below is a surgical method used for female sterilization.

(a) Which surgical method is shown in the diagram ?

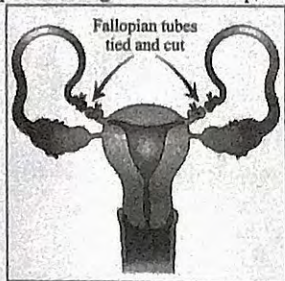
(1)

(b) What is the surgical method of male sterilization called ?

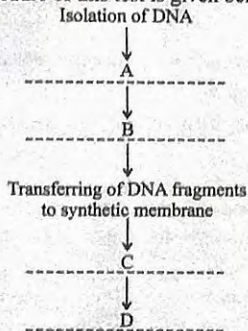
(1)

(c) Mention any 2 copper releasing IUD's used to prevent conception.

(1)



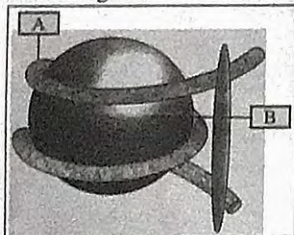
19. To solve a dispute of parentage, the court put an order to conduct a test to prove the paternity of the child. Procedure of this test is given below.



- (a) Identify the test.
- (b) Complete the missing steps.
20. Observe the diagram.

(1)

($\frac{1}{2} \times 4 = 2$)



- (a) What does it represent ?
- (b) Identify parts labelled as A and B.

(1)

(1 + 1)