

Reg. No. :

SME-26

Name :

SECOND YEAR HIGHER SECONDARY MODEL EXAMINATION, FEBRUARY 2020

Part – III
BIOLOGY
(Botany & Zoology)
Maximum : 60 Scores

Time : 2 Hours
Cool-off time : 20 Minutes
Preparatory Time : 5 Minutes

General Instructions to Candidates :

- There is a 'Cool-off time' of 10 minutes each for Botany and Zoology in addition to the writing time of 1 hour each. Further there is a '5 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 ബോട്ടണിയിലും സൂവോളജിയിലും 10 മിനിറ്റ് വീതം 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടാതെ ബോട്ടണി പരീക്ഷയ്ക്കുശേഷം സൂവോളജി പരീക്ഷ തുടങ്ങുന്നതിനുമുമ്പ് '5 മിനിറ്റ്' തയ്യാറെടുപ്പുകൾ നടത്തുന്നതിനായി നൽകുന്നതാണ്. 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 നൽകിയിട്ടുണ്ട്.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

**PART – A
BOTANY
(Maximum : 30 Scores)**

**Time : 1 Hour
Cool-off time : 10 Minutes**

I. Answer any 3 questions from 1 – 5. Each carries 1 score. (3 × 1 = 3)

1. Choose the correct answer and fill in the blank.

_____ is the female gametophyte of angiosperms.

- | | |
|----------------|------------------|
| (a) Embryo sac | (b) Nucellus |
| (c) Integument | (d) Pollen grain |

2. Choose the correct answer.

Natural aging of a lake by nutrient enrichment of its water is called

- | | |
|----------------------|--------------------|
| (a) Biomagnification | (b) Algal bloom |
| (c) Succession | (d) Eutrophication |

3. Fill in the blank :

The wheat variety having high protein content used as donor in bio-fortification is _____.

4. Name the type of interaction between an orchid plant and Mango tree.

5. Find the odd one.

Hilsa, Sardine, Rohu, Mackerel

II. Answer any 9 questions from 6 – 16. Each carries 2 scores. (9 × 2 = 18)

6. The innermost wall layer of Microsporangium is Tapetum.

- | |
|--|
| (a) What is its function ? |
| (b) Write two features of Tapetal cells. |

7. Match the following :

- | A | B |
|------------------|----------------|
| a. Chlamydomonas | i. Gemmule |
| b. Conidia | ii. Zoospore |
| c. Sponge | iii. Bulbil |
| d. Hydra | iv. Pencillium |
| | v. Buds |

8. Explain the terms :

- (a) Micro propagation.
- (b) Totipotency.

9. Explain the separation of DNA fragments using gel electrophoresis.

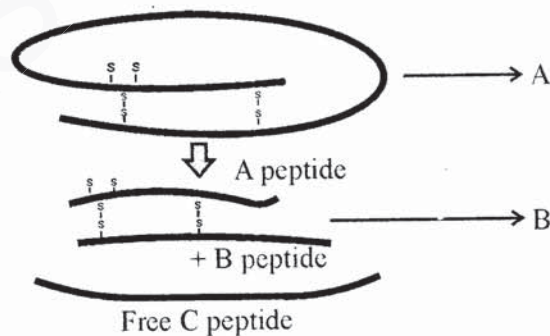
10. Write notes on :

- (a) Micro injection
- (b) Biolistics

11. Amplification of gene of interest is done using PCR.

- (a) Expand PCR.
- (b) Mention the three steps of this process.

12. Observe the diagram and answer A and B.

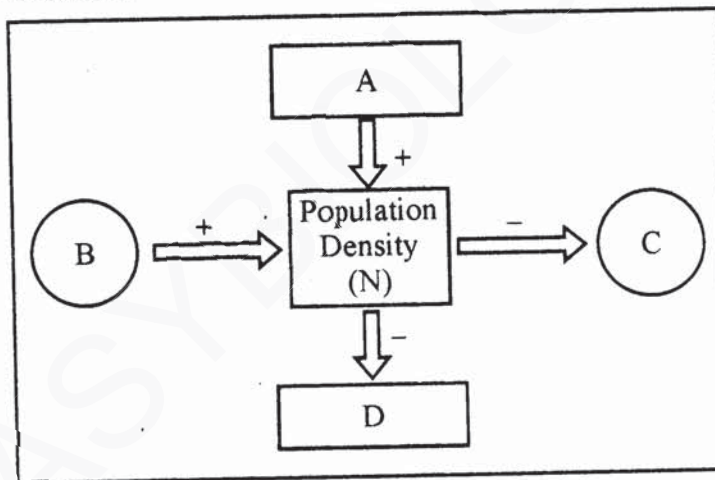


13. (a) Define transgenic animals.
(b) Write any two uses of transgenic animals.
14. Humification and Mineralisation occur during decomposition in the soil. Write the difference between these two processes.
15. (a) Construct a grazing food chain using the following organisms :
Bird, Grass, Grasshopper
(b) Write the trophic level of grasshopper.
16. Why is CNG better than diesel or petrol ?

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

(3 × 3 = 9)

17. Briefly describe the adaptations of desert plants.
18. Density of a population fluctuates due to changes in four basic processes.
(a) Complete the diagram by adding the points A B C and D.
(b) Explain A and D.



19. Air pollution is a serious environmental issue. Give three harmful effects of air pollution.
20. Mention the out-breeding devices in plants to prevent self pollination. (any 3 points)

PART – B
ZOOLOGY

(Maximum : 30 Scores)

Time : 1 Hour

Cool-off time : 10 Minutes

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

(3 × 1 = 3)

1. Name the cells that provide nutrition to the germ cells.
(a) Leydig cells (b) Sertoli cells
(c) Spermatogonia (d) Oogonia

2. _____ denotes the phenomenon in which a species confined to a particular geographical region and not found anywhere else.
(a) Endemism (b) Ex-situ conservation
(c) In-situ Conservation (d) Hot spots

3. Identify the disease from the following indicators :
 - Widal Test is done to confirm the disease.
 - Sustained high fever, weakness, loss of appetite etc. are common symptoms.
 - Pathogens enter the body through contaminated water.(a) Typhoid (b) Malaria
(c) AIDS (d) Filariasis

4. Which technique is suitable to treat infertility due to inability of the male partner to inseminate the female ?
(a) ZIFT (b) GIFT
(c) AI (d) IVF

5. Identify the additional sequences of RNA in an mRNA molecule that are not translated, and required for efficient translation process.
UTRs, AUG, hnRNA, VNTR

II. Answer any 9 questions from 6 – 16. Each carries 2 scores. (9 × 2 = 18)

6. After the completion of replication, each DNA molecule contains one parental and one newly synthesized daughter strand.
- Name this scheme of replication.
 - Who proposed this scheme ?

7. Arrange the items given in the box under suitable headings.

Divergent Evolution, Eye of Octopus and Mammals, Hipper of Whale and Forelimb of Cheetah, Convergent Evolution.

8. 'Microbes produce acetic acid, lipases, citric acid, ethanol, cyclosporine A, pectinases, statins and many other useful substances.'

- Identify two bioactive molecules produced by the microbes from the above list.
- Write its use.

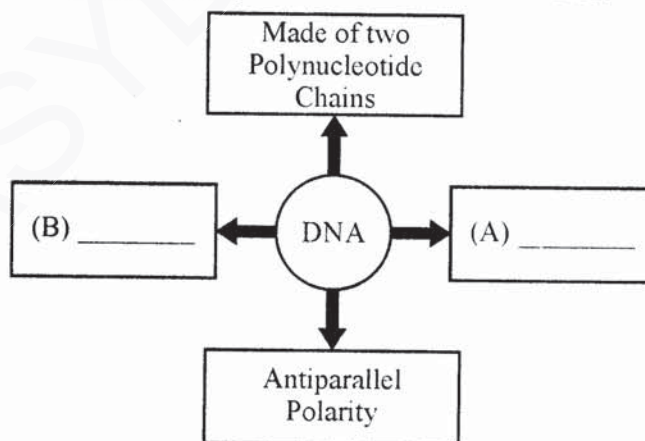
9. "Darwin finches provide a best example for 'Adaptive Radiation'."

- What is adaptive radiation ?
- Write two other examples for adaptive radiation.

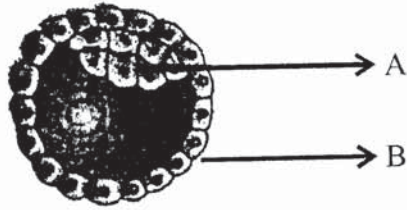
10. 'Oral contraceptive pills inhibit ovulation and alter the quality of cervical mucus to prevent the entry of sperms.'

- Which component in oral contraceptive pill inhibit ovulation ?
- Name an oral contraceptive pill developed in CDRI.
- Name the surgical terminal method of contraception in male and female.

11. Complete the illustration showing the salient features of DNA.



12. Observe the figure.



- Identify the figure.
- Name the parts labelled A and B.
- Write the function of 'A'.

13. Match the given diseases with their pathogens suitably.

A	B
(i) Malaria	(a) Rhinovirus
(ii) Common Cold	(b) Wuchereria
(iii) Filariasis	(c) Trichophyton
(iv) Ringworm	(d) Plasmodium
	(e) Salmonella

14. Do you think lactational amenorrhea is the most suitable method of natural contraception ?

Write one advantage and disadvantage of this method.

15. "Cytological observations in certain insects revealed a specific nuclear structure all through spermatogenesis."

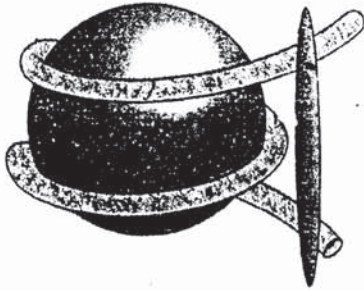
- Name the structure.
- Name the Scientist who identified it.
- Write its significance in sex determination.

16. Certain sportspersons misuse anabolic steroids to enhance their performance. Write any two specific side effects of anabolic steroids in male and female.

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

(3 × 3 = 9)

17. Observe the figure.



- (a) Identify the figure.
- (b) Explain the packaging of DNA helix in Eukaryotes.
18. Greater biological diversity is reported in tropics than the temperate regions. Why ?
(Hint : Any 3 points)
19. ‘Three types of RNAs are needed to synthesize a protein in a bacterial cell.’
- (a) Which are the three types of RNAs in bacteria ?
- (b) Write one function of each.
20. Certain chromosomal disorders, its symptoms and the genetic constitution of the affected are given below. Fill the blanks suitably.

A	B	C
(i) (a) _____	45A + XX/XY	(b) _____
(ii) Klinefelter syndrome	(c) _____	(d) _____
(iii) (e) _____	44A + XO	(f) _____