Reg. No. :

SY-26

Name :

SECOND YEAR HIGHER SECONDARY EXAMINATION, MARCH 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 ബോട്ടണിയ്ക്കും സുവോളജിയ്ക്കും 10 മിനിറ്റ് വീതം 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടാതെ ബോട്ടണി പരീക്ഷയ്ക്കുശേഷം സുവോളജി പരീക്ഷ തുടങ്ങുന്നതിനുമുമ്പ് '5 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 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. Which one of the following has the largest population in a food chain ?

   (a) Producers (b) Primary consumers

   (c) Secondary consumers (d) Tertiary consumers

2. Which among the following is a selectable marker in pBR – 322 ?

   (a) "Ori" (b) Hind III

   (c) amp^R (d) rop

3. _____ is a better yielding semi dwarf variety of rice developed in India.

   (a) Sonalika (b) Kalyan Sona

   (c) IR-8 (d) Jaya

4. What is a Clone ?

5. Fill up the blank suitably.

   Mortality : No. of deaths in the population during a given period.

   _____ : No. of births in the population during a given period.

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

6. What are the main consequences of Global warming ?

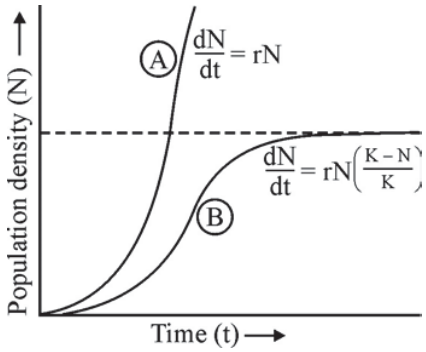
7. What is the difference between hydrarch succession and xerarch succession.

8. Suggest any two methods for the disposal of solid wastes.

9. Match the columns A and B.

A		B	
(a)	Rhizome	(i)	Agave
(b)	Bulbil	(ii)	Water hyacinth
(c)	Offset	(iii)	Ginger
(d)	Leaf buds	(iv)	Potato
		(v)	Bryophyllum

10. Identify the types of population growth noted in the graph as 'A' and 'B'.



11. How does the inactive protoxin of Bacillus thuringiensis gets converted into active toxin when an insect ingest it ?

12. Given below is a data showing number of individuals and dry weight of different trophic levels in a grassland ecosystem. Construct,
    (a) Pyramid of number
    (b) Pyramid of biomass

Trophic Level	Number of individuals	Dry weight (Kg m^{-2})
Primary Producer	5,842,000	809
Primary Consumer	7,08,000	37
Secondary Consumer	3,54,000	11
Tertiary Consumer	3	1.5

13. How can you differentiate true fruits from false fruits ?

14. What is biofortification ? Write any two objectives of biofortification.

15. How can we make a host cell competent to receive a foreign gene or DNA ?

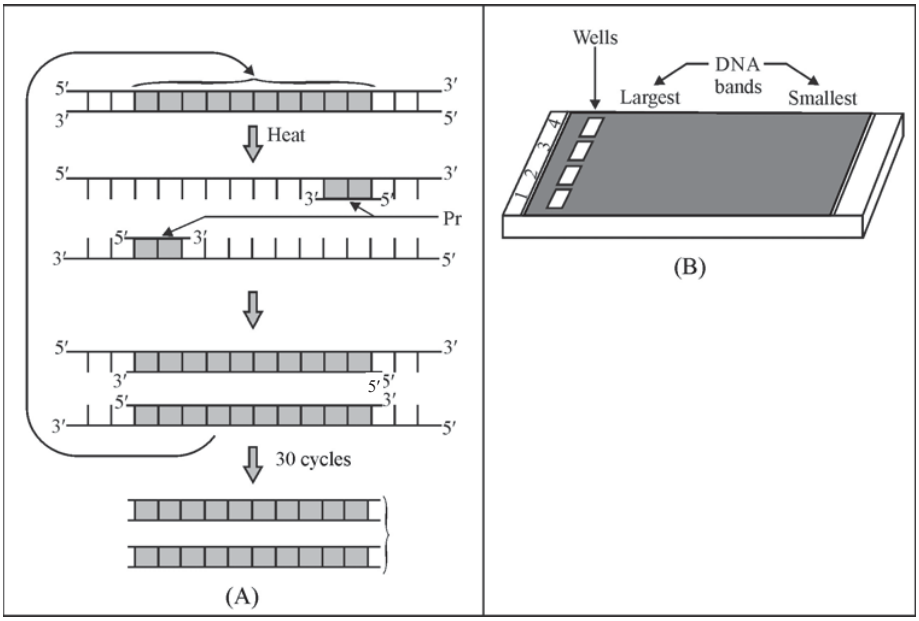
16. Early diagnosis is essential for the effective treatment of a disease. Write any two molecular diagnostic methods.

III. Answer any 3 questions from 17 – 20. Each carries 3 scores. **(3 × 3 = 9)**

17. Define the following terms :
    (a) Autogamy
    (b) Geitonogamy
    (c) Xenogamy

18. Ozone depletion in stratosphere is a serious environmental issue.
    (a) What is good ozone ?
    (b) How do CFCs degrade ozone molecules in stratosphere ?

19. The following are the diagrams of two important processes used in rDNA technology.
    (a) Identify A and B.
    (b) Write the uses of A and B in rDNA technology.



20. Given below are examples for some ecological/population interactions. Place them under suitable columns provided below.
    (a) Abingdon tortoise and goat.
    (b) Cuscuta and host tree.
    (c) Fig tree and wasp.
    (d) Algae and fungi in Lichens
    (e) Belanus and Chathamalus bernacles
    (f) Lice on humans.

Competition	Parasitism	Mutualism
•	•	•
•	•	•

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. From the following, find out the symbol used in the human pedigree analysis representing male.

(a) ○ (b) ◇

(c) □ (d) ●

2. Name the technique of transferring embryos upto 8 blastomeres into the fallopian tube.

(a) GIFT (b) ZIFT

(c) ICSI (d) IUI

3. Microbe which help in the production of Biogas.

(a) *Aspergillus niger* (b) *Trichoderma Polysporum*

(c) *Saccharomyces cerevisiae* (d) *Methanobacterium*

4. Which of the following human ancestor is more 'ape' like ?

(a) *Homo habilis* (b) *Dryopithecus*

(c) *Australo pithecines* (d) *Homo erectus*

5. Select the cause of extinction of Cichlid fish in lake Victoria of East Africa.

(a) Habitat loss and fragmentation (b) Over-exploitation

(c) Alien species invasions (d) Co-extinctions

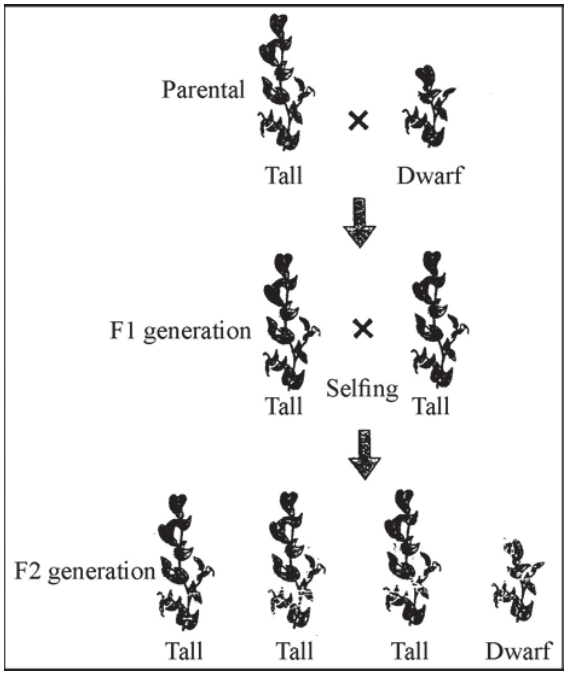
II. Answer any 9 questions from 6 – 16. Each carries 2 scores. **(9 × 2 = 18)**

6. Some examples of microbes in human welfare are given. Classify them under the headings given below.

[Egs : *Rhizobium, Propionibacterium sharmanii, Azaspirillum, Lactic acid bacteria, Anabaena, Azotobacter, Aspergillus niger, Saccharomyces cerevisiae...*]

Microbes in Household Products	Microbes as Bio-fertilizers

7. Observe the figure given below showing Mendel's experiment using pea plants.



(a) Identify the cross

(b) Which are the laws proposed by Mendel based on this observations ?

8. "All copulations lead to fertilization and pregnancy". Do you agree with this statement ? Justify your answer.

9. Fill the blanks in Column A and B using appropriate terms.

Theory	Scientists
(a) Theory of natural selection	A
(b) Use and disuse of organs	B
(c) Theory of mutation	C
(d) Theory of spontaneous generation	D

10. One of the salient features of genetic code is "Universal".

(a) Write any other two salient features of Genetic code.

(b) Which is the initiator codon ? And name the amino acid it codes.

11. Amniocentesis for sex determination is legally banned now.

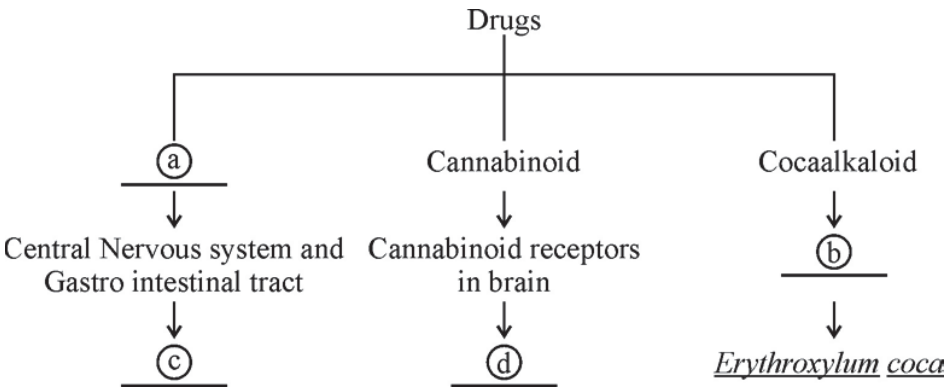
    (a) What is amniocentesis ?

    (b) Why it is banned ?

12. Name any two protozoan diseases, its causative organism and any two symptoms.

13. Tropical Amazonian rainforest in South America has the greatest biodiversity on earth. Do you agree with this ? Explain.

14. Complete the illustration chart given below.



15. Correct the following statements, if there is any mistake :

    (a) Haemophilia is a autosome linked recessive disease.

    (b) Turner's syndrome is due to the presence of an additional copy of X chromosome.

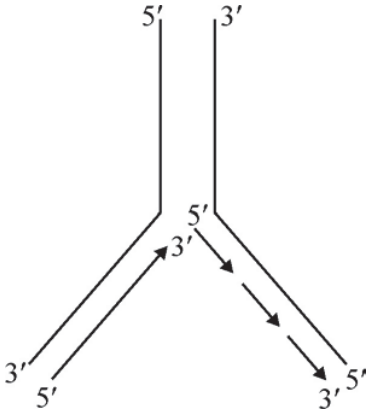
16. $p^2 + 2pq + q^2 = 1$ denotes an evolutionary principle.

    (a) Name the principle.

    (b) Mention any three factors affecting this.

III. Answer any 3 questions from 17 – 20. Each carries 3 scores. **(3 × 3 = 9)**

17. Observe the figure given below :



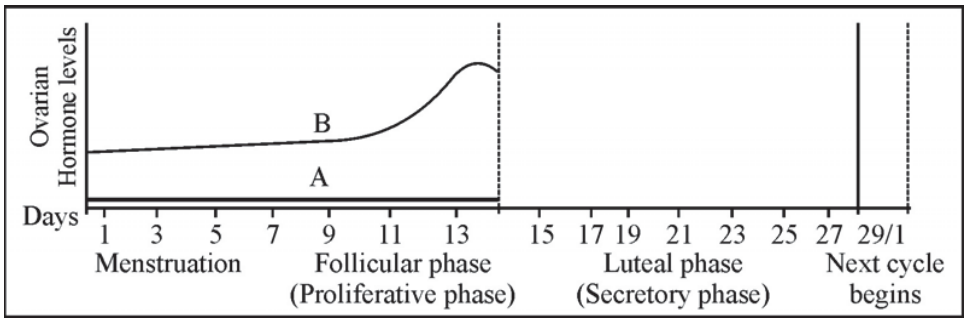
(a) Identify the process in the picture.

(b) Name any two enzymes needed for this process.

(c) Write the peculiarities of the newly synthesized daughter strands.

18. Explain the measures useful for prevention and control of alcohol and drugs abuse among adolescents.

19. The graph given below shows the level of the ovarian hormones in a normally menstruating woman during the follicular phase.



(a) Name 'A' and 'B'.

(b) Reconstruct the graph showing the level of hormones in luteal phase.

(c) Name the hormone secreted by Corpus Luteum and mention its function.

20. A DNA sequence is provided below.

5' – ATGCATGCATGCATGCATGCATGCAT – 3'

(a) Write down the sequence of its complementary strand.

(b) Name the enzyme involved in transcription of DNA.

(c) What would happen if both the strands of the DNA act as templates for transcription ?

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