Reg. No. : .....

Name : .....

Code No. 7017

Second Year – JUNE 2017
SAY/IMPROVEMENT

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

Part – III

BIOLOGY

Maximum : 60 Scores

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 '5 minutes' 'Preparatory Time' at the end of the Botany Examination and before the commencement of Zoology Examination.
- You are not allowed to write your answers nor to discuss anything with others during the 'cool-off time' and 'Preparatory Time'.
- Use the 'cool-off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- All questions are compulsory and only internal choice is allowed.
- When you select a question, all the sub-questions must be answered from the same question itself.
- 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.

നിർദ്ദേശങ്ങൾ :

- 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.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം എഴുതണം.
- ഒരു ചോദ്യനമ്പർ ഉത്തരമെഴുതാൻ തെരഞ്ഞെടുത്തു കഴിഞ്ഞാൽ ഉപചോദ്യങ്ങളും അതേ ചോദ്യ നമ്പരിൽ നിന്ന് തന്നെ തെരഞ്ഞെടുക്കേണ്ടതാണ്.
- 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

1. Increase in concentration of toxic substance of successive trophic level is called
   (a) Biofortification
   (b) Bioaccumulation
   (c) Phytoremediation
   (d) Biomagnification **(Score : 1)**

2. Origin of replication and selectable markers are the two important features required for a cloning vector. Explain their role in facilitating cloning. **(Scores : 2)**

3. In flowering plants male flower is called _____ flower and female flower is known as _____ flower. **(Score : ½ × 2 = 1)**

4. Out crossing and cross breeding are two different aspects of outbreeding in animals. How out crossing is different from cross breeding ? **(Scores : 2)**

5. Rhizome, bulbil, offset and bulb are different methods of vegetative reproduction in plants. Of these, the vegetative reproductive structures of Agave and Ginger are _____ and _____ respectively. **(Score : ½ × 2 = 1)**

6. (A) Rose is a flower pollinated by insect while in paddy pollination is by wind. Give any three adaptations existing in these plants to facilitate their respective mode of pollination. **(Scores : ½ × 6 = 3)**

OR

(B) Double fertilization and triple fusion are the two terms associated with angiosperm fertilization.
   (a) What is double fertilization ?
   (b) Explain triple fusion.
   (c) Give the ploidy level of
      (i) endosperm
      (ii) zygote **(Scores : 1 × 3 = 3)**

7. Nutrient enrichment in a fresh water lake leads to eutrophication.

(a) What happens during eutrophication ?

(b) How dissolved oxygen level is affected as a result of this ? **(Scores : 1 × 2 = 2)**

8. The natural reservoir of phosphorous is rock where it is present in the form of phosphates. How this phosphorous is cycled in ecosystem ? **(Scores : 2)**

9. Natality, Mortality, Immigration & Migration are the four factors that affect population density in a region. Explain any two terms. **(Scores : 1 × 2 = 2)**

10. Denaturation, Annealing and Extension are three steps of a process used for gene amplification :

(a) Name the process. **(Score : 1)**

(b) Name the organism from which the DNA polymerase for this process is extracted. **(Score : 1)**

11. There are four mechanisms by which living organisms other than human beings maintain the constancy of internal environment. Name these processes. **(Scores : ½ × 4 = 2)**

12. The practice of maintenance of honeybees for the production is called _____. **(Score : 1)**

13. (A) Bt cotton is an example of genetically engineered cotton.

(a) What does Bt stands for ?

(b) Name the gene responsible for Bt toxin production.

(c) How does the toxin kill the insect ? **(Scores : 1 × 3 = 3)**

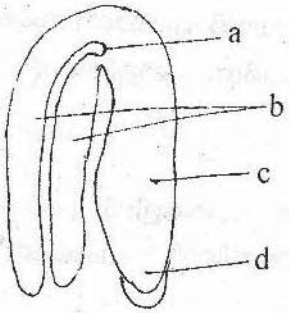
OR

(B) Gene therapy is a corrective therapy for a hereditary disease.

(a) Name the disease which was successfully corrected by gene therapy for the first time. **(Score : 1)**

(b) How gene therapy is practiced for a permanent cure of the disease ? **(Scores : 2)**

14. Identify the following parts of a dicot embryo.



(Scores : 2)

15. Grasshopper, Grass, Man and Birds represent members in a food chain.

Draw a food chain representing each of the above in different trophic levels. **(Scores : 2)**

16. Antigen-antibody reaction is the basis of the technique called

(a) ELISA

(b) PCR

(c) RNA interference

(d) Gene therapy

(Score : 1)

17. Among the following which one is used for reducing the emission of poisonous gases from automobiles

(a) Landfills

(b) Catalytic converter

(c) Electrostatic precipitator

(d) Earmuffs

(Score : 1)

PART – B

ZOOLOGY

(Maximum : 30 Scores) **Time : 1 Hour**

Cool-off time : 10 Minutes

1. Human female possess 44 + XX chromosome number. The chromosome number of secondary oocyte is

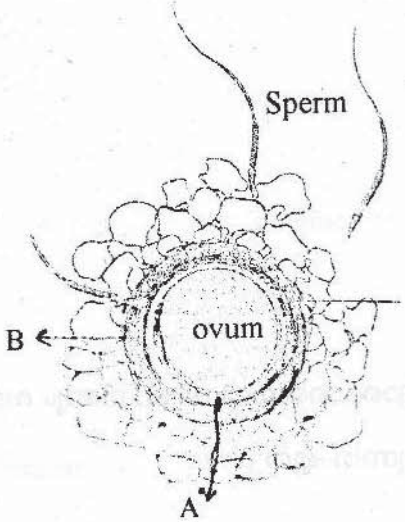
   (a) 44 + X (b) 22 + X

   (c) 44 + XX (d) 22 + XX **(Score : 1)**

2. Rearrange the following in the order of their evolution period :

   – *Australopithecines*
   – *Neanderthal man*
   – *Homo sapiens*
   – *Homo erectus*
   – *Dryopithicus* **(Score : 1)**

3. Observe the diagram and answer the questions :



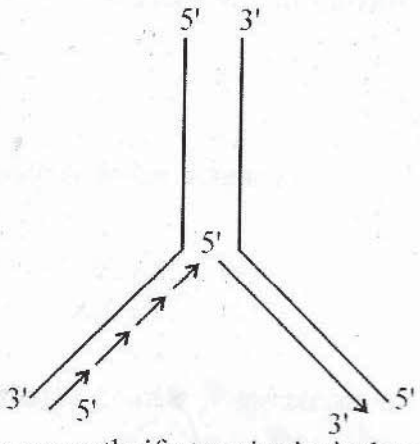
   (a) Identify A and B.

   (b) Write the function of B. **(Scores : 2)**

4. Find the odd one and write the common feature of others.
   Cytidine, Adenine, Thymine, Guanine **(Score : 1)**

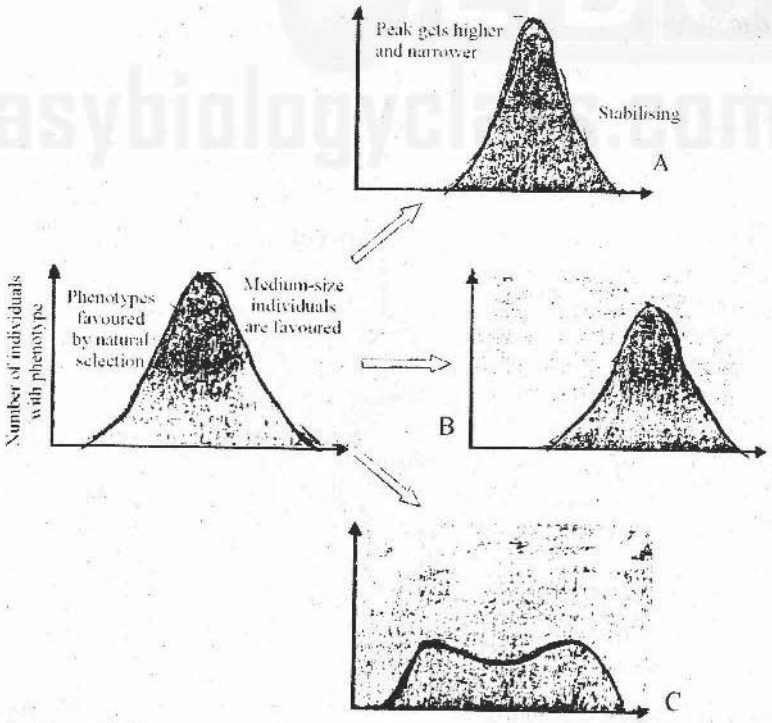
5. Prepare a brief note to be presented in an awareness programme for adolescents about AIDS, their causes and preventive measures. **(Scores : 3)**

6. Observe the diagram :



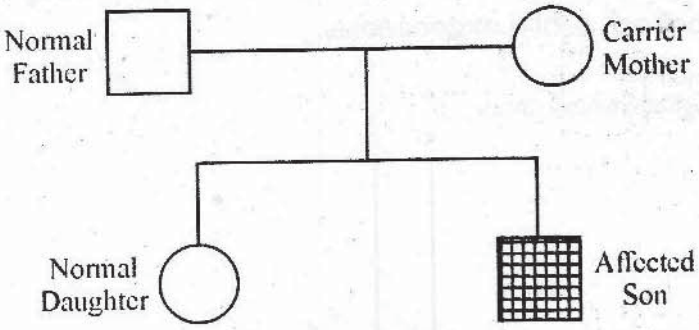
(a) Redraw the diagram correctly if any mistake is there.
(b) What does the diagram indicate ?
(c) What is the function of DNA ligase in this process ? **(Scores : 2)**

7. Diagrammatic representation of the operation of Natural Selection on different traits is given. Observe it and answer the questions :



(a) What do B and C represent ?
(b) Explain the process shown in B and C. **(Scores : 3)**

8. Observe the diagrammatic representation of the following pedigree analysis and answer the questions :

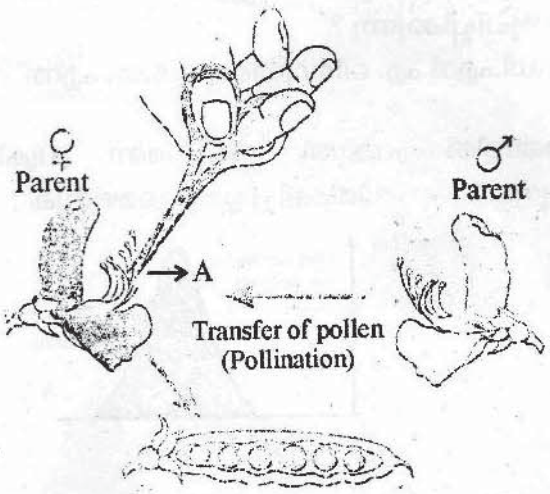


(a) Describe the type of inheritance shown in the diagram.

(b) Distinguish between Mendelian disorder and chromosomal disorder with example. **(Scores : 3)**

9. Observe the following diagram and answer the questions :

(Hint : Steps in making a cross in pea plant)



(a) Name the process marked as A and write its significance.

(b) Diagrammatically represent a monohybrid cross between Tall and dwarf pea plants. **(Scores : 2)**

10. Read the codon sequence in the mRNA unit which is undergoing translation.

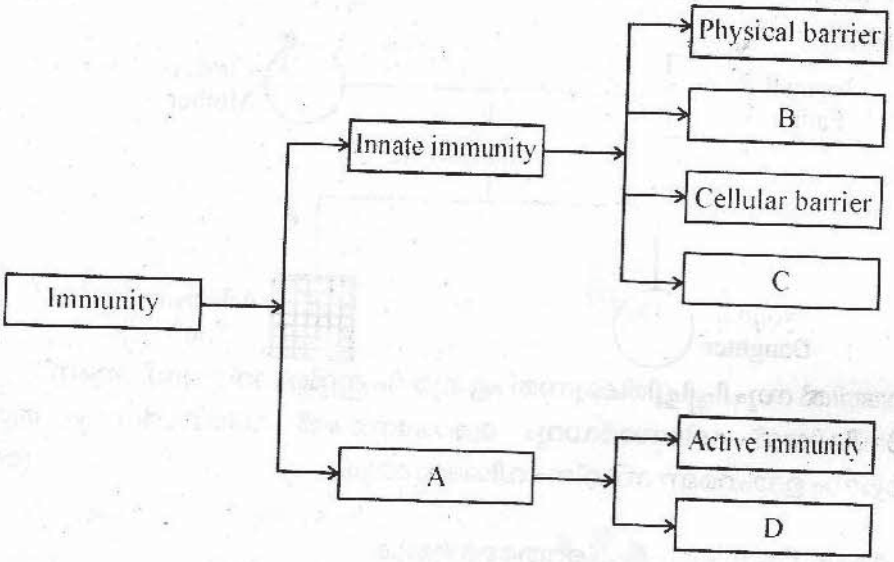
A U G U A U U U C G C U G A U U U U U A G

(a) What will happen if the nitrogen base 'U' in the sixth position is replaced by 'A' by point mutation ?

(b) Name and define this type of mutation.

(c) Draw the base sequence in the coding DNA strand from which the above mRNA is transcribed. **(Scores : 3)**

11. Fill the boxes A, B, C and D.



(Scores : 2)

12. Complete the table by filling A, B, C and D using hints from the bracket :
(Gobar gas, Biological Control, Anabaena, *Saccharomyces cerevisiae*, *Propionibacterium sharmanii*)

Methanogens	–	A
Bread making	–	B
Biofertilizer	–	C
Trichoderma	–	D

(Scores : 2)

13. Fill the blanks A, B, C and D using correct terms given in the box.

Passive Immunity
Sensitivity to some particles
Metastasis
Active Immunity
Auto immune deficiency
Immune deficiency disease

(a)	A	–	Cancer
(b)	Allergy	–	B
(c)	C	–	AIDS
(d)	Rheumatoid arthritis	–	D

14. Explain the three levels of biodiversity. **(Scores : 2)**

OR

Explain different types of biodiversity conservation with example. **(Scores : 3)**

(Scores : 3)

SECOND YEAR HIGHER SECONDARY EXAMINATION, JUNE 2017
(Finalised Scheme of Valuation)

Subject: Biology - Part A Botany **Code No: 7017 Part A**

Qn.No	Scoring Indicators	Split Score	Total Score
1.	Biomagnification	1	1.
2.	Ori - Sequence from where replication starts - any piece of DNA when linked to ori made to replicate - Control copy number - make copy (Any one point)	1	
	selectable markers - Identifying and eliminating transformants from non transformants. - selectively permitting the growth of transformants. - Identify transformation - Identify recombination - Any two examples of selectable markers. (Any one point)	1	2.

SECOND YEAR HIGHER SECONDARY EXAMINATION, JUNE 2017

2

Qn. No	Sub Qns	Answer Key / Value points	Score	Total
3.		Staminate pistilate	½ ½	1
4.		Out crossing - mating of animals within the same breed, but no common ancestors on either side of pedigree for 4-6 generations OR crossing of distant relatives of the same breed cross breed - one breedcross to another breed. or crossing of different breeds. eg:- Bikaneri ewe × marino ram ↓ Hesardale (½ score)	1 1	2.
5.		Agave - bulbil Ginger - Rhizome	½ ½	1
6.	A	Insect pollination (entomophylly) - Attractive, fragrant, large, nectar		

SECOND YEAR HIGHER SECONDARY EXAMINATION, JUNE 2017

Qn. No	Sub Qns	Answer Key / Value points	Score	Total
		(Any two points related to insect pollination)	1½	
		wind pollination - Light pollen, non sticky, well exposed stamen, feathery stigma, single ovule, Inflorescence	1½	3
		(Any two points related to wind pollination)		
		OR.		
	B. a.	Syngamy + Triple fusion → Double fertilisation or definition	1	
	b.	one male gamete fuses with secondary nucleus (polar nuclii) to produce primary endosperm (PEN)	1	3.
	c.	(i) endosperm - Triploid / 3n	½	
		(ii) zygote - Diploid / 2n.	½	1
7.	a.	Fertility increases, organisms flourishes, lake become shallowed and warmer, Finaly converted to land or Algal bloom, nutrient enrichment		

4

SECOND YEAR HIGHER SECONDARY EXAMINATION, JUNE 2017

Qn. No	Sub Qns	Answer Ke y / Value points	Score	Total
		(Any one point related to eutrophication)	1	2
	b.	Dissolved oxygen decreases / Changes	1	
8.		Rocks weathered → phosphates → released to soil → Absorbed by plants → when dies phosphorous released by bacteria.	2.	2.
		or Diagramatic representation of Phosphorous cycle		
9.		Natality - No of births in a given period in a population or Birth rate.	Any two 1+1	2.
		mortality - No of deaths in a population or Death rate.		
		Immigration - No of individual of same sps that have come into the habitat from else where in a time period.		
		Emigration - Individuals left the habitat in a given period.		

B.

SECOND YEAR HIGHER SECONDARY EXAMINATION, JUNE 2017

Qn. No	Sub Qns	Answer Key / Value points	Score	Total
10.	a.	PCR / amplification of gene of interest	1	2
	b.	Thermus aquaticus	1	
11.		Regulati, migrati, Conform, suspend hibernation, aestivation, Diapause endospore formation Any four points.	½ x 4	2.
12.		Apiculture / bee keeping	1	1
13.	A.			
	a.	Bacillus thuringiensis	1	
	b.	Cry / Bt toxin gene	1	
	c.	In the alkaline pH of insect gut, pro toxin get activated to active toxin, binds the surface of midgut epithelial cells cause lysis, eventually death. or Inactive toxin become active in high pH.	1	3.

SECOND YEAR HIGHER SECONDARY EXAMINATION, JUNE 2017

Qn. No	Sub Qns	Answer Key / Value points	Score	Total
	B. a.	ADA / Adenosine deaminase deficiency SCID	1	
	b.	gene isolate from bone marrow cells producing ADA is introduced into cells at early embryonic stage.	2	3.
14.		a. plumule b. cotyledon c. hypocotyl d. Radicle (Any two)	1X2	2.
15		Grass → Grass hopper - Bird → man primary producers - primary consumers (I trophic level) (2nd trophic level) → secondary consumers - Tertiary consumers (3rd trophi level) (4th trophic level) or Correct food chain give full score.	2	2.
16.	a.	ELISA.	1	1
17.	b.	Catalytic converter	1	1

Total score - 30