

Reg. No. :

Code No. 2017

Name :

**SECOND YEAR
SAY/IMPROVEMENT
JUNE 2018**

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 in 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 the 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 ബോട്ടണിയും സുവോളജിയും 10 മിനിറ്റ് വീതം 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടാതെ ബോട്ടണി പരീക്ഷയ്ക്കുശേഷം സുവോളജി 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 സമയത്ത് 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****(Questions 1 to 3) : Answer all the questions. Each question carries 1 Score.****(3 × 1 = 3)**

1. Identify the freshwater fish from the following :

(a) Sardine

(b) Mackerel

(c) Rohu

(d) Hilsa

2. In Gel electrophoresis the separated DNA fragments can be visualized after staining. Name the stain used for it.

3. In a forest ecosystem different plant species are occupied in different vertical levels. Name such vertical arrangement.

(Questions 4 to 14) : Answer any 9 questions. Each question carries 2 Scores.**(9 × 2 = 18)**

4. Primate and non-primate female mammals exhibit cyclic changes in the activities of ovaries and accessory ducts as well as hormones during the reproductive phase. Name the cyclic changes in these group.

5. Bamboo species and Strobilanthus Kunthiana exhibit usual flowering phenomena. Explain their flowering characteristics.

6. A population has certain attributes that an individual organism does not. What are they ?
7. Multiple copies of gene of interest can be synthesised in vitro. Name the technique and its requirements.
8. Catalytic converters are used in automobiles to control air pollution. Briefly comment on its role.
9. Your friend wishes to start a poultry farm. What are the important suggestions given to him for successful management of the farm ?
10. Pollination by water is seen in Zostera and Vallisnaria. Enumerate its adaptations.
11. Parasites evolved special adaptations to live on host. What are they ?
12. Domestic sewage and industrial effluents contain large amount of nutrients. What are the probable effects of these nutrients on water bodies ?

13. Match the Column A with Column B :

Column A	Column B
(a) Human Alpha lactalbumin	(1) ELISA
(b) Antigen Antibody Interaction	(2) ELI LILLY
(c) Genetically engineered Insulin	(3) CORN BORER
(d) Cry I Ab	(4) ROSIE
	(5) BOLL WORM

14. Humification leads to accumulation of a dark coloured amorphous substance. Identify the substance and its peculiarities.

(Questions 15 to 18) : Answer any 3 questions. Each question carries 3 Scores.

(3 × 3 = 9)

15. Bt cotton is a transgenic pest resistant plant.

- How this was achieved ?
- How do this plant survive on pest attack ?

16. Depending on the source of pollen, pollination can be divided into three types. What are they ? Explain each.

17. Hydrach succession take place in wetter areas and the successional series progress from 'hydric' to 'mesic' condition. List out the stages in correct sequence.

18. Restriction endonuclease enzymes are used to cut the DNA at specific sequence.

- Write the name of first isolated one.
- Write the convention for naming these enzymes.

PART – B**ZOOLOGY****(Maximum : 30 Scores)****Time : 1 Hour****Cool-off time : 10 Minutes****Answer all the following questions from 1 to 3. Each question carries 1 Score.****(3 × 1 = 3)**

1. Number of spermatids produced from 25 primary spermatocyte are _____
 - (a) 25
 - (b) 50
 - (c) 100
 - (d) 250

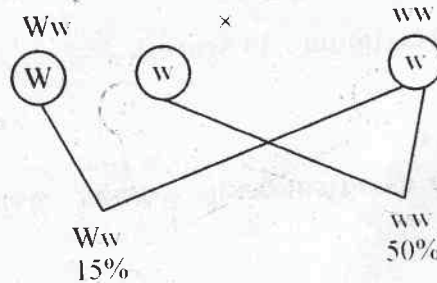
2. Study the relationship between the first two words and fill the blank space with a suitable word.
Sterilization in male : Vasectomy
Sterilization in female : _____

3. Identify the bacterial disease from the following :
 - (a) Typhoid
 - (b) Amoebiasis
 - (c) Malaria
 - (d) Filariasis

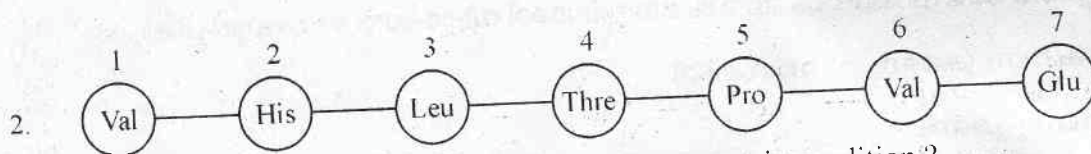
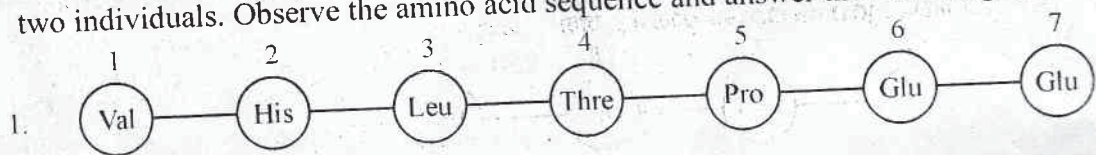
Answer any 9 from the questions 4-14. Each carries 2 Scores.**(9 × 2 = 18)**

4. The incidence of STDs are reported more among the age group between 15-24 years.
 - (a) What are STDs ?
 - (b) Suggest methods to prevent STDs.

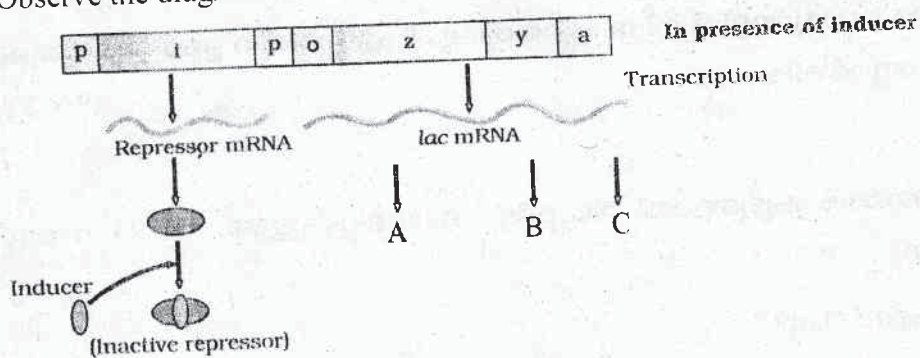
5. Observe the following cross between heterozygous dominant progeny and homozygous recessive parent. Answer the following questions.



- (a) Identify the cross.
 (b) Mention the significance of this cross.
6. Following diagram shows amino acid sequences of a part of β chain of Haemoglobin of two individuals. Observe the amino acid sequence and answer the following questions :



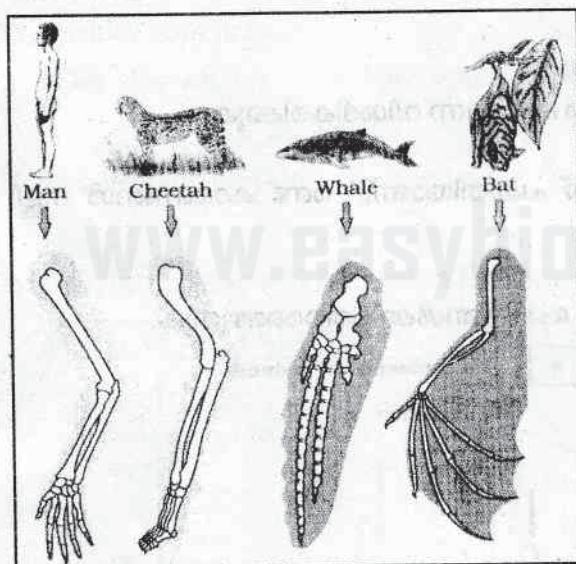
- (a) Which among the above indicates sickle cell anaemic condition?
 (b) Justify your answer.
 (c) Describe what is single base substitution.
7. "Human genome project is a mega project" Give two reasons to explain this.
8. Observe the diagram and answer the following questions :



- (a) Identify the diagram.
 (b) Name the enzymes A, B and C.

9. In sewage treatment plants microbes play a significant role. Distinguish between primary and secondary treatment in sewage plants.
10. Human beings can conserve and protect our ecosystem and biodiversity. Prepare a handout to show different methods of Biodiversity conservation.
11. "Genetic code is universal in nature".
 (a) Substantiate this statement.
 (b) Mention any two other salient features of genetic code.
12. $p^2 + 2pq + q^2 = 1$ is the gene frequency of a population showing an evolutionary principle.
 (a) Name the principle.
 (b) Enlist any three factors affecting this principle.
13. The blood group of a child is 'O'. His father is with 'A' blood group and mother with 'B' blood group. Write down the genotype of the child and genotypes of parents.

14.



Above homologous organs provide evidence for a particular type of evolution.

- (a) Identify the type of evolution.
 (b) What do you mean by homologous organs ?

(Q. 15 to 18). Answer any three. Each carries 3 scores.

(3 × 3 = 9)

15. Match the columns B & C with column A.

A	B	C
Ovulation	Endometrium	LH
Implantation	Uterus	Progesteron
Gestation	Graafian follicle	hCG

16. Prepare a flowchart of evolution of man in descending order by choosing the names given below :

Homo sapiens, Homo erectus, Homo habilis,
Australopithecines, Ramapithecus, Neanderthal

17. Classify the following barriers of innate immunity under three suitable headings :

Skin, Saliva, WBC, Monocyte,
Mucus, Acid of stomach

18. Expand the following :

- (1) SNP
- (2) BAC
- (3) YAC

SECOND YEAR HIGHER SECONDARY EXAMINATION 2018

SUBJECT: Botany

CODE. NO: 2017

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
1		Robu	1	1
2		Ethidium bromide	1	1
3		stratification / herb, shrub, trees	1	1
4		Primates - Menstrual cycle Non-primates - Oestrus cycle	2	2
5		Bamboo sps - flowers only after 50-100 years strobilanthus kunthiana - flowers only once in 12 years / Mono carpic (full score)	2	2
6		Natality / Birth rate Mortality / Death rate Sex ratio Age distribution population density [Any two points]	(2)	2
7		PCR - Polymerase chain reaction Requirements - 2 sets of primers DNA polymerase enzyme / Taq Polymerase or Target DNA, Primers, Nucleotides and Taq polymerase [Any one requirement]	(1) (1)	2






Qn No	Sub Qns	Answer Key/Value Points	Score	Total
8		<ul style="list-style-type: none"> * Combust hydrocarbons are converted into CO_2 & water * Carbon monoxide is changed to CO_2 * Nitric oxide is changed to free Nitrogen <p>(Any two points) [Any two relevant points related to air pollution]</p>	2	2
9.		<ul style="list-style-type: none"> * Selection of disease free and suitable breeds of poultry * Proper and safe farm conditions * Proper feed and water * Proper hygiene <p>[Any two relevant points]</p>	2	2
10		<ul style="list-style-type: none"> * In <u>Vallisneria</u> the female flower reach the surface of water by long stalk and the male flowers or pollengrains are released onto the surface of water * In <u>Zostera</u> the female flowers remain submerged in water and the pollengrains are released inside the water * Pollengrains in many species are ribbon like. 		

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
		* In some species pollen grains are protected from wetting by a mucilaginous covering (Any two points)	2	2
	11	* Loss of unnecessary sense organs * Presence of adhesive organ / suckers * Loss of digestive system * High reproductive capacity [Any two points]	2	2
	12	Excessive growth of planktonic algae / Algal bloom * Deterioration of the water quality and fish mortality * Eutrophication * Biomagnification [Any two points]	2	2
	13	a Human Alpha lactalbumin - 4. Rosie b. Antigen Antibody Interaction 1. ELISA c Genetically Engineered Insulin 2. Eli Lilly d Cry I Ab 3. Corn based	2	2

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
14		<ul style="list-style-type: none"> * Humus (1) * High resistant microbial action * Decomposition at an extremely slow rate * Serves as a reservoir of nutrients * Release of inorganic nutrients <p>(Any three)</p>	- (1)	2
15	(a)	<p>Isolated Bt. toxin gene from <u>Bacillus thuringiensis</u> and incorporated into cotton plant. / Cry gene</p>	1 1/2	
	(b)	<ul style="list-style-type: none"> * Bt. Cotton has insecticidal proteins/ protoxins/ inactive toxin * Insects ingest the inactive toxin * The inactive toxin converted into an active form of toxin due to the alkaline pH of the gut of insect * The activated toxin binds to the surface of midgut epithelial cells and cause cell swelling and lysis and eventually cause death. 		3
		Correct explanation	1 1/2	

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
16		<p>* Autogamy - Pollination within a flower Definition of Autogamy</p> <p>* Geitonogamy - Pollination within a plant Definition of Geitonogamy</p> <p>* Xenogamy - Pollination between two plants of the same sps Definition of Xenogamy</p>	3	3
17		<p>Phytoplanktons. Submerged plant stage Submerged free floating plant stage Reed - swamp stage Marsh - meadow stage Scrub stage Forest (in correct order)</p> <p>or</p> <ul style="list-style-type: none"> * Phytoplanktons * rooted submerged plants * rooted-floating angiosperms * free-floating plants * Reed swamp * Marsh meadow, * scrub * Trees (in correct order) <p>[Any three correct sequential order]</p>	3	3

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
18		Hind II * First letter indicates Genus name of the bacteria from which the enzyme isolated * Second and third letter - species of bacteria * Fourth letter - strain * Roman letter - Order in which the enzyme was isolated	1 2	3

1. Kumari Jini
St. George's VHS
Chowallass
Kollom  9447032776
2. Meena N-Jacob
Mar Elias H.S.S
Kottappady
Ernakulam  9447303545
3. Sujia PK
Govtss For Deaf Kunnankulam
Thrikkur
9847865461 
4. Anila Cheriyan
M. S H S S Ranny
Pathanamthitta - 9447207388 AnilaCherian
5. Robins PJ
St. Joseph H.S.
Pavuratty. 8078
9288650961. TLR. 
6. Sulfi M
Janatha H.S.S (1053)
Thembamoodu
Thiruvananthapuram
9496154587. 

200LOGY II YEAR Q.P. 11

Q. 2.

Code No. 2017

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
1.		c) 100	1	1
2.		Tubectomy	1	1
3.		Typhoid.	1	1
4.		a) Sexually Transmitted Disease b) (Any two points). 1. Avoid sex with unknown partners 2. Use condom during coitus 3. Proper awareness regarding STD's 4. Treatment from a qualified doctor.	1 1/2 1/2	2
5.		a. Test cross b. To determine whether F ₁ or F ₂ parents are homozygous dominant or heterozygous To test the purity of gametes	1 1	2
6.		a. Second amino acid chain or 2nd. b. 6 th position glutamic acid is replaced by valine. c. Substitution of only a single base GAG - GUG in the triplet codon, resulting in a change in the amino acid of the polypeptide chain -	1/2 1/2 1	2.

- 2 -

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
7	1. 2. 3. 4.	13-year long project Estimated cost of the project is 9 billion US dollars It has approximately 3×10^9 bp Enormous amount of data to be stored in computers (Any two points).	1 1	2
8.	a b.	Lac operon. A - β galactosidase B - Permease C - Trans acetylase	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
9.		<u>Primary Treatment</u> : Physical removal of materials by sequential filtration or sedimentation. <u>Secondary Treatment</u> : Biological treatment aeration and constant agitation to improve growth of bacteria associated with fungal filaments to form flocs.	1 1	2
10		Briefly describe methods of 1. In situ conservation 2. Ex situ conservation	1 1	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
11	a	From bacteria to human being each triplet codon codes for the same amino acid. It is same in almost all organism.	1	2
	b.	1. Unambiguous and specific 2. Degenerate 3. Triplet 4. Commaless 5. Non-overlapping. 6. Degeneracy 7. Initiator codon. 8. Terminator codon. (Any two)	1/2 1/2	
12.		a. Hardy Weinberg Principle. b. Gene flow, genetic drift, mutation, recombination, natural selection. (Any three)	1/2 1 1/2	2
13.		Genotype of child 'O' group is Father A i Mother B i	1 1/2 1/2	2
14.	1.	Divergent evolution	1	2
	2.	Organs with common ancestry and hence structurally similar but functionally dissimilar	1	

4.

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
15	1. 2. 3.	Ovulation - Graafian follicle - LH Implantation - Endometrium - Progesterone Gestation - Uterus - hCG	1 1 1	3
16		Ramapithecus ↓ Australopithecus ↓ Homo habilis ↓ Homo erectus ↓ Neanderthal ↓ Homo sapiens	1/2 1/2 1/2 1/2 1/2 1/2	3
17		Physical barrier - Skin, mucus Physiological barrier - Acid in stomach, saliva Cellular barrier - WBCs, Monocyte	1 1 1	3

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Qn No	Sub Qns	Answer Key/Value Points	Score	Total
28		<p>SNP - Single Nucleotide polymorphism</p> <p>BAC - Bacterial Artificial Chromosome</p> <p>YAC - Yeast Artificial Chromosome</p>	1 1 1	3