

Reg. No. :

Code No. 2017

Name :

**Second Year – JUNE 2016
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 സുവോളജിക്ക്കും 10 മിനിറ്റ് വീതം 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടാതെ ബോട്ടണി പരീക്ഷയ്ക്കുശേഷം സുവോളജി പരീക്ഷ തുടങ്ങുന്നതിനുമുമ്പ് '5 മിനിറ്റ്' തയ്യാറെടുപ്പുകൾ നടത്തുന്നതിനായി നൽകുന്നതാണ്. ഈ വേളകളിൽ ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാനോ, മറ്റുള്ളവരുമായി ആശയവിനിമയം നടത്താനോ പാടില്ല.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം എഴുതണം.
- ഒരു ചോദ്യനമ്പർ ഉത്തരമെഴുതാൻ തെരഞ്ഞെടുത്തു കഴിഞ്ഞാൽ ഉപചോദ്യങ്ങളും അതേ ചോദ്യനമ്പറിൽ നിന്ന് തന്നെ തെരഞ്ഞെടുക്കേണ്ടതാണ്.
- 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

1. The development of pollengrains in Angiosperms is called
 - (a) Microsporogenesis
 - (b) Embryogenesis
 - (c) Megasporogenesis
 - (d) Gametogenesis

(Score : 1)

2. Select the one which is not helping vegetative propagation.
 - (a) Bulb
 - (b) Clone
 - (c) Adventitious buds
 - (d) Eyes of the potato

(Score : 1)

3. (a) Describe the major steps followed for the production of new genetic variety starting from the collection of germplasm upto elucidating the cultivars.

(Scores : 1½)

(b) A plant breeder has a rare variety of cultivar with him but unfortunately it has become infected with virus. Suggest a suitable technique to produce many viable number of progenies with a short note.

(Scores : 1½)

4. Which of the following part in a flower is haploid ?
 - (a) Antherwall
 - (b) Pollen mother cell
 - (c) Synergid
 - (d) Secondary nucleus

(Score : 1)

5. In aquatic plants like water hyacinth and water Lily the pollinating agent is
 - (a) Wind and insect
 - (b) Water
 - (c) Birds and butterflies
 - (d) Aquatic organisms

(Score : 1)

6. Electrophoresis is a method commonly used in Biotechnology. Write briefly about GelElectrophoresis.

(Scores : 2)

2017

2

7. RNA can suppress the activity of a gene. Explain it with suitable example. (Scores : 2)

8. (a) Biogeochemical cycle is an important phenomenon in very ecosystem. Describe phosphorus cycle. (Scores : 3)

OR

(b) The plant communities in a given area show successive changes. Mention the stages of succession in a xerosere. (Scores : 3)

9. The hard outer layer of pollen is composed of

(a) Exine

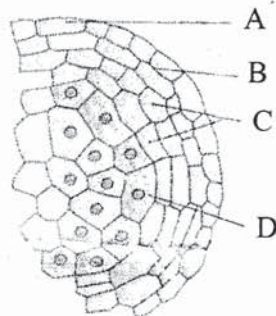
(b) Intine

(c) Integument

(d) Sporopollenin

(Score : 1)

10. Observe the following diagram and label A, B, C and D.



(Scores : 2)

11. Genetic engineering is a promising branch recently developed in biological science.

(a) Expand PCR and name three steps in each cycle.

(Scores : 2)

OR

(b) What is a plasmid ? Name three features required for cloning vectors.

(Scores : 2)

12. Many diseases could be treated by an advanced technique called gene therapy. Assess its role in the treatment of lymphocyte disorder, giving any suitable example. (Scores : 2)

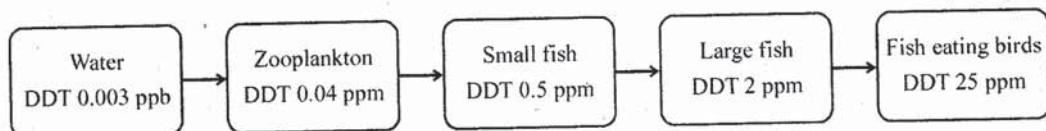
13. Population growth may be exponential or logistic. Differentiate between them. (Scores : 2)

14. Quantity of pollutants increase in successive trophic levels. Observe the flowchart regarding biomagnifications of DDT in an aquatic food chain and answer the following :

(a) What is biomagnification ?

(b) What are the consequences of biomagnification ?

(Scores : 2)



15. Plants are adapted to grow in different habitats. Name any four adaptations of plants in desert habitat. (Scores : 2)

16. Earthworms are commonly referred as farmers' friends. Define fragmentation. (Score : 1)

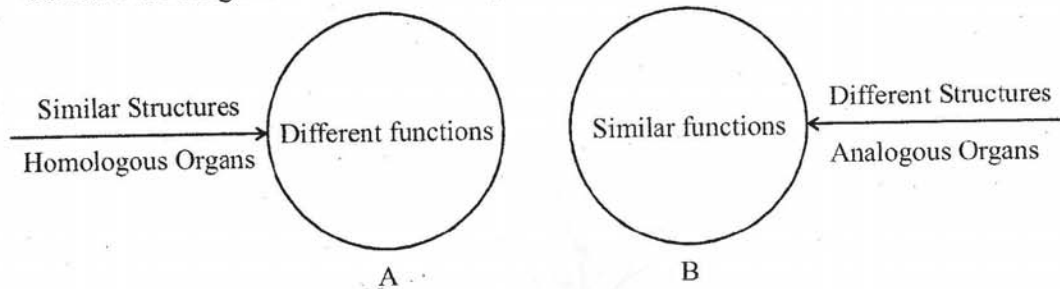
17. Adequate waste management is an environmental issue to be considered. Discuss the advantages of Eco-san toilet. (Scores : 2)

Part – B
ZOOLOGY
(Maximum : 30 Scores)

Time : 1 Hour

Cool-off time : 10 Minutes

1. The process of fusion of a sperm with ovum is called _____. **(Score : 1)**
2. Observe the diagram and answer the questions below :

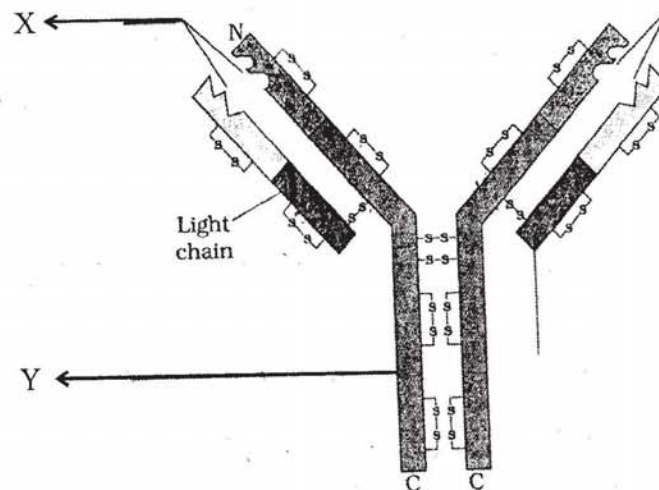


- (a) Identify the types of evolution in the concept diagrams A and B. **(Score : 1)**
- (b) Write example pair each for homologous and analogous organs. **(Score : 1)**
3. Choose the correct answer from the bracket.
Cyclosporin A is produced by _____.

[(a) Aspergillus (b) Clostridium (c) Trichoderma (d) Acetobacter]

(Score : 1)

4. Answer the questions about the given figure :



- (a) Identify the parts X and Y. **(Score : 1)**
- (b) Name any two types of this molecule. **(Score : 1)**

2017

8

5. Select a bio-control agent from the given microbes :

- (a) Baculo virus (b) Rhino virus
(c) Picorna virus (d) Adeno virus

(Score : 1)

6. Match columns A and B :

A	B
Ovulation	Sperm
Luteal Phase	Oogenesis
Acrosome	Blasto cyst
Inner cell mass	LH
	Progesterone

(Scores : 2)

7. Statements below show the features of some human fossils. Read carefully and identify the fossil.

- (a) Human like beings with brains capacities between 650 – 800 cc
(b) Lived in East and Central Asia with brain capacity of 1400 cc.

(Scores : 2)

8. Observe the figure of mRNA and answer the questions :



(a) Find the start and stop codons. (Score : 1)

(b) How many amino acids will be present in the protein translated from this mRNA ?

(Score : 1)

(c) The additional sequences that are not translated in mRNA are called _____.

(Score : 1)

9. Select the odd one out and justify your selection.

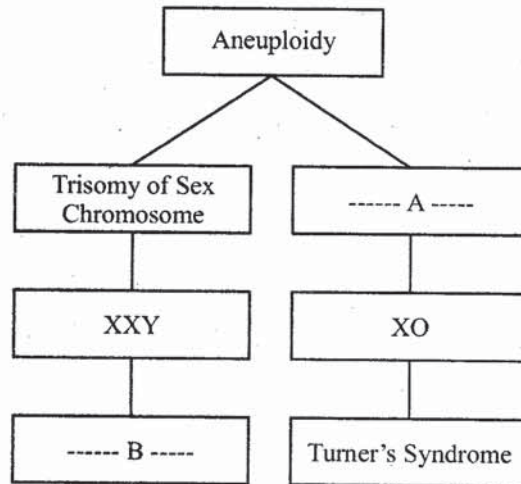
Malaria, Gonorrhoea, Amoebiasis, Filariasis

(Score : 1)

2017

10

10. (a) Complete the flow chart of chromosomal disorder by filling the blank boxes (A and B) :



(Scores : 2)

- (b) What is aneuploidy ?

(Score : 1)

11. (a) The hints of the lac operon is given below :

Hints :

Inducer, Repressor,
Structural genes, operator
Regulatory gene

- (i) Which substance is acting as inducer in this operon ?

(Score : 1)

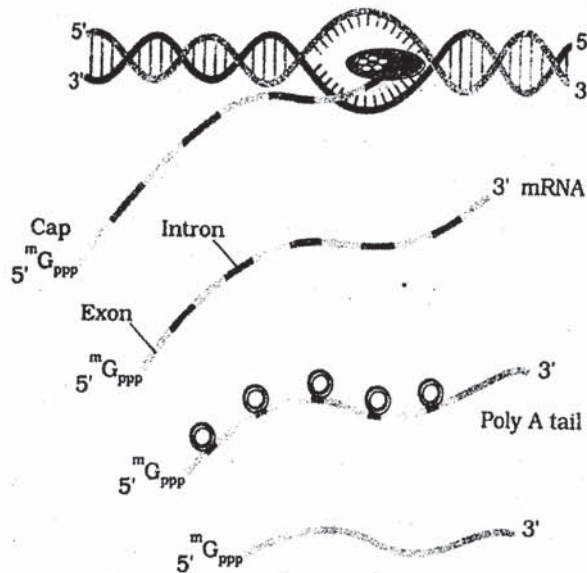
- (ii) Explain the working of operon in presence of the inducer.

(Scores : 2)

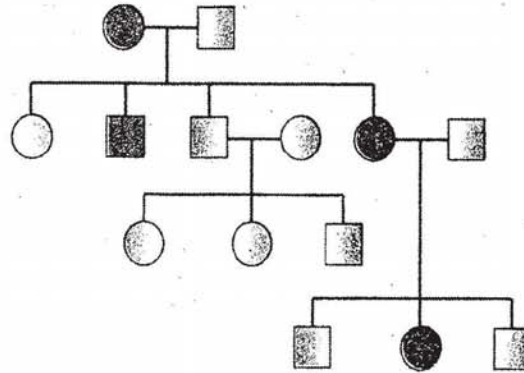
OR

- (b) With the help of the figure given, explain the processing of hnRNA to mRNA in eukaryotes.

(Scores : 3)



12. Observe the figure below and answer the questions following :



- (a) Identify the figure
 (b) What shows the shaded symbols used ? (Scores : 2)
13. Diagnostic report of two couples having infertility problems are given below :
- (1) The woman cannot produce ovum.
 - (2) The man has very low sperm count in semen.
- Suggest a suitable Assisted Reproductive Technologies (ART) for each problem in expanded form. (Scores : 2)
14. Complete the table by filling a, b, c and d.

Disease	Pathogen	Symptom
----- a -----	<i>Streptococcus pneumoniae</i>	Alveoli filled with fluid
Common cold	----- b -----	Nasal congestion and discharge
----- c -----	<i>Plasmodium vivax</i>	Chill and fever
Filariasis	<i>Wuchereria</i>	----- d -----

- (Scores : 2)
15. (a) “When we conserve and protect the whole ecosystem, its biodiversity at all levels is protected.” Based on this statement explain the strategies of biodiversity conservation. (Scores : 3)
- OR**
- (b) “When need turns to greed, it leads to biodiversity loss.” Substantiate this statement by explaining two causes of biodiversity loss. (Scores : 3)

SECOND YEAR HIGHER SECONDARY SAY/IMP. EXAMINATION, JUNE 2016.
(Finalised Scheme of Valuation)

Subject: Biology - Part A Botany

Code No: 2017 Part A

Qn.No	Scoring Indicators	Split Score	Total Score
1	Microsporogenesis	1	1
2.	Clone	1	1
3a	Collection of variability Evaluation and selection of parents Cross hybridisation Selection and testing of superior recombinants Testing, release and commercialisation of new cultivars (Any 3 points)	$\frac{1}{2} \times 3$	$1\frac{1}{2}$
(b)	meristem culture short explanation of meristem culture OR. (Tissue culture & its explanation)	$\frac{1}{2}$ $\frac{1}{2} * \frac{1}{2}$	$1\frac{1}{2}$ 1
4	c-synergid	1	1
5	a- Wind and insect	1	1
6	Separation of DNA fragments DNAs are -vely charged particles The fragments of macromolecules move towards anode under an		

Qn.No	Scoring Indicators	Split Score	Total Score
	<ul style="list-style-type: none"> - electric field through a medium. - ethidium bromide used for staining - exposed to UV rays. - The smaller the fragment size, the faster it moves - Extracted by elution <p style="text-align: center;">(Any 4 points)</p>	1/2 x 4	2
7	<p>Silencing of a specific mRNA Prevent infestation of pest meloidogyne (Any point related to RNA interference)</p> <p>meloidogyne incognita in tobacco plants</p>	1 1	2
8	<p style="text-align: center;">OR Full explanation give at</p>	3	

Qn.No	Scoring Indicators	Split Score	Total Score
	full score or $\frac{1}{2}$ score to each point in flow chart without correct sequence.		
9	d- sporo pollenio	1	1
10	A epidermis B Endothecium c middle layer D Tapetum	$\frac{1}{2} \times 4$	2
11a	PCR - Polymerase chain reaction Denaturation, Annealing, Expansion OR.	$\frac{1}{2}$ } $\frac{1}{2} \times 3$ }	2.
b	Extra chromosomal DNA origin of replication, selectable marker, cloning sites	$\frac{1}{2}$ } $\frac{1}{2} \times 3$ }	2
12	ADA gene The lymphocytes of patients is cultured outside. ADA gene is introduced cell is introduced into the patient	$\frac{1}{2}$ } $\frac{1}{2} \times 3$ }	2
13	Exponential - Resources unlimited / J shaped curve / equation Logistic - Resources limited / sigmoid / S shaped curve / equation	1 } 1 }	2

Qn.No	Scoring Indicators	Split Score	Total Score
14a	Increase in concentration of toxicant at successive trophic level	1	2
b	thinning of egg shell/premature breaking	1	
15	Thick cuticle, stomata in pits or sunken stomata, store water in the body, CAM pathway, no leaf, spines, photosynthetic functions by flattened stem (Any 4)	1/2 x 4	2
16.	Break down of detritus into small particles:	1	1
17	Excreta can be recycled into fertilizer. (compost), Hygienic, efficient, cost effective, reduces wastage of water; reduces the need for chemical fertilizer. (Any two)	1 x 2	2