Reg. No. : .....

Name : HSSLIVE

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)**

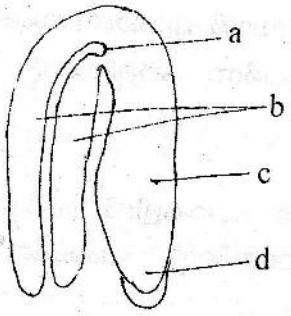
OR

(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*

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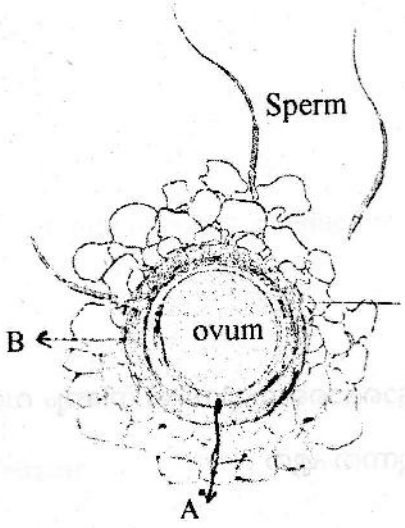
   (Score : 1)

3. Observe the diagram and answer the questions :



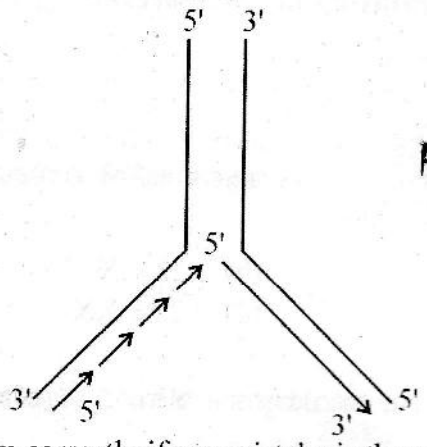
   (a) Identify A and B.

   (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)**

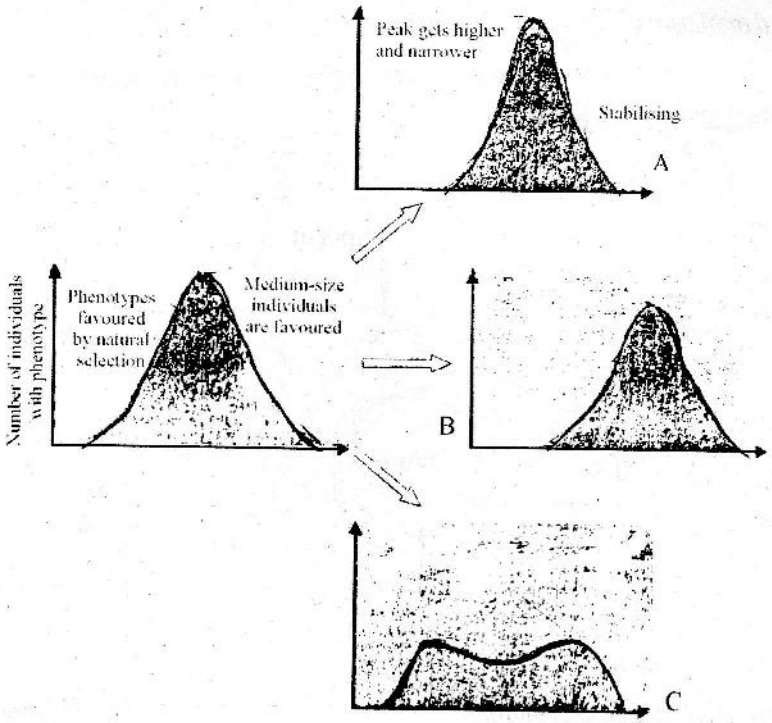
5. Prepare a brief note to be presented in an awareness programme for adolescents about AIDS, their causes and preventive measures. **(Scores : 3)**

6. Observe the diagram :



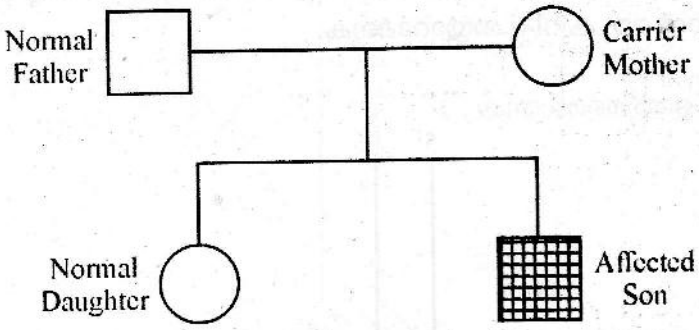
(a) Redraw the diagram correctly if any mistake is there.
(b) What does the diagram indicate ?
(c) What is the function of DNA ligase in this process ? **(Scores : 2)**

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 :

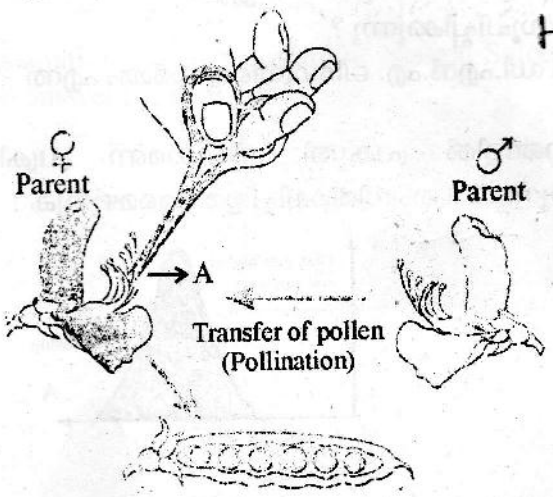


(a) Describe the type of inheritance shown in the diagram.

(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.

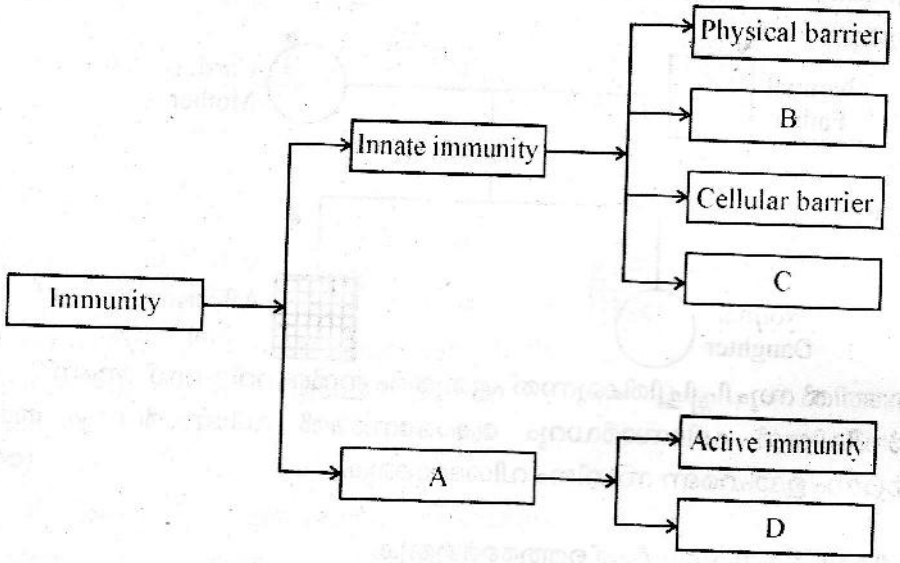
A UG UA UUU CG C UG A UUUUUA G

(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

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(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

(Scores : 2)

14. Explain the three levels of biodiversity. **(Scores : 3)**

OR

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