Code No. 1017

Second Year – March 2016

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 സുവോളജിക്കും 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 ചോദ്യനമ്പരിൽ നിന്ന് തന്നെ തെരഞ്ഞെടുക്കേണ്ടതാണ്.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നൽകിയിട്ടുണ്ട്.
- 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. When a gamete without any fusion develop into a new organism the phenomenon is called

   (a) Syngamy (b) External fertilization

   (c) Parthenogenesis (d) Parthenocarpy **(Score : 1)**

2. In some seeds the nucellus may be persistent. Such nucellus is called

   (a) Endosperm (b) Scutellum

   (c) Plumule (d) Perisperm **(Score : 1)**

3. Nutrients are never lost from the ecosystems and are recycled. Write about

   (a) gaseous cycle

   (b) sedimentary cycle **(Scores : 1 + 1)**

4. Increase in the concentration of toxicants at successive trophic level is called

   (a) BOD (b) Biomagnification

   (c) Eutrophication (d) Algal Bloom **(Score : 1)**

5. The recombinant DNA technological process have made immense impact in the area of healthcare. How Eli Lilly produced Insulin ? **(Scores : 2)**

6. (a) Resistance is the ability to prevent the pathogen from causing disease.

   (1) Elucidate the steps in breeding for disease resistance.

   (2) Cite two examples for virus resistant plants. **(Scores : 3)**

   OR

   (b) Tissue culture is an achievement in plant breeding. What is a somaclone ? Describe the production of somatic hybrid. **(Scores : 3)**

7. What is a false fruit ? Cite an example. **(Scores : 2)**

8. Many of the flowering plants have developed some devices for discouraging in breeding. Write any two of them. **(Scores : 2)**

9. On earth, life exists even in extreme and harsh conditions. Mention any two major biomes in India. **(Score : 1)**

10. Ecological pyramids are usually upright. Meanwhile some, pyramid of biomass is inverted. Explain the reason. **(Scores : 2)**

11. (a) Population interactions may be beneficial or not. Write any three interactions in detail. **(Scores : 3)**

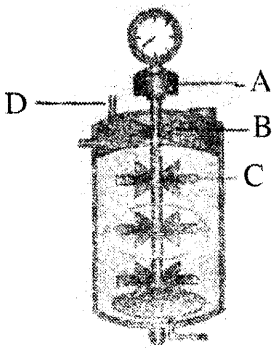
OR

(b) Organism are influenced by biotic and abiotic factors. Write an account of any three abiotic environmental factors. **(Scores : 3)**

12. The major pollution in the environment is caused by automobiles. Expand the term CNG. Mention any two of its merits. **(Scores : 2)**

13. Some ethical standards are required to evaluate the morality of all human activities. Explain Biopiracy. **(Scores : 2)**

14. Temperature is generally increasing making the earth a hot plate. Mention any two measures to control global warming. **(Score : 1)**

15. 

Observe the sketch of stirred-tank bioreactor and label the parts A, B, C and D. **(Scores : 2)**

16. Manipulating with nucleic acid is a trend in Biotechnology.
    (a) Name any one organism used as vector.
    (b) What are DNA polymerase ? **(Scores : 2)**

17. A unisexual flower having no androecium is called
    (a) Dithecous (b) Dioecious
    (c) Monoecious (d) Pistillate **(Score : 1)**

PART – B

ZOOLOGY

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

Cool-off time : 10 Minutes

1. Which of the following is not a Mendelian disorder ?
   Colourblindness, Down's syndrome, Haemophilia, Thalassemia **(Score : 1)**

2. Study the following cross and answer the questions.
   [Hint : ABO blood group in man is controlled by three alleles I^A, I^B and i.]

   Father (Blood group A) × Mother (Blood group B)

   Son (Blood group O)

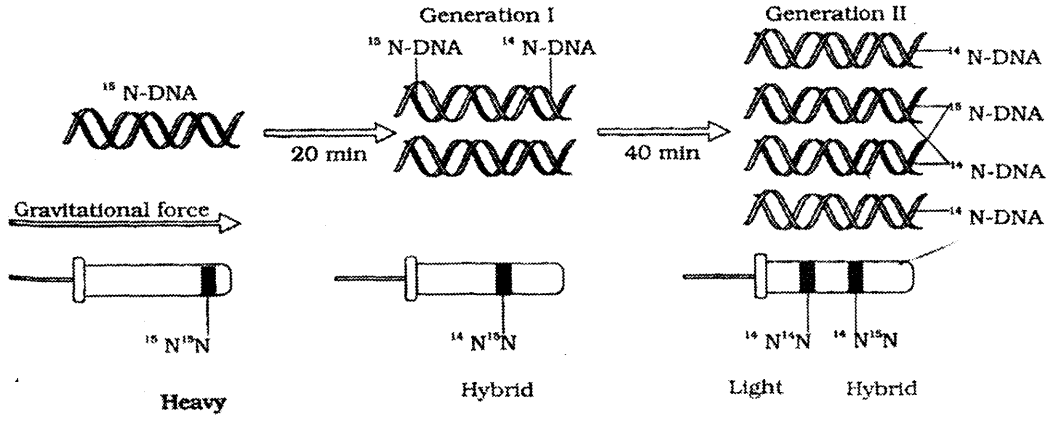
   (a) Write the genotypes of Father, Mother and Son.
   (b) The type of dominance of human blood group inheritance is _____. **(Scores : 2)**

3. Categorise the given birth control methods into three groups with proper heads.

Cervical caps, Vasectomy, Cu T, Tubectomy, Diaphragms, Condoms, Lippes Loop

(Scores : 3)

4. Results of a famous experiment is given in the figure. Answer the questions.

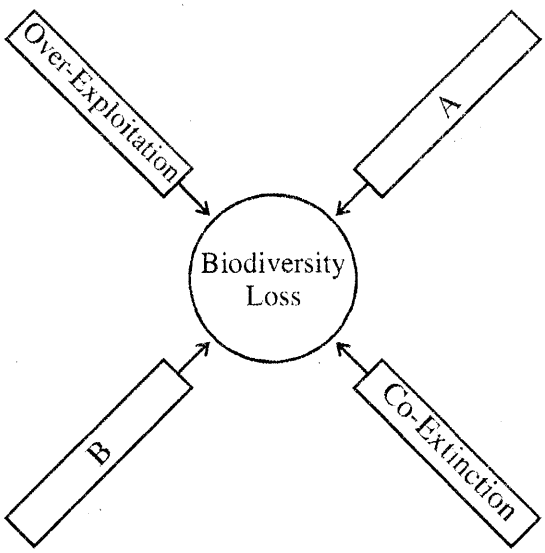


(Separation of DNA by Centrifugation)

   (a) Identify the experiment.
   (b) Which property of the DNA is proved by this experiment ?

(Scores : 2)

5. Observe the concept diagram of the Evil Quartet of biodiversity loss.



(a) Write A and B.

(b) What is Co-Extinction ?

(Scores : 2)

6. Match the columns A and B :

A	B
Corpus Luteum	Embryo
Leydig cells	Implantation
Blastocyst	Progesterone
Inner cell mass	Androgens
	Prolactin

(Scores : 2)

7. Read the statements and choose the correct option :

A : Sacred grooves are examples of *in situ* conservation

B : Biodiversity hotspots have low degree of endemism.

C : Biodiversity increases when number of organisms in a particular species increases.

(a) Statement 'A' alone is correct.

(b) Statements 'A' and 'B' are correct.

(c) Statements 'A' and 'C' are correct.

(d) Statement 'C' alone is correct.

(Score : 1)

8. Read carefully the sequence of codons in the mRNA unit and answer the questions.

(a) What change is needed in the first codon to start the translation process ?

(b) If translation starts by that change, till which codon it can continuous ? Why ?

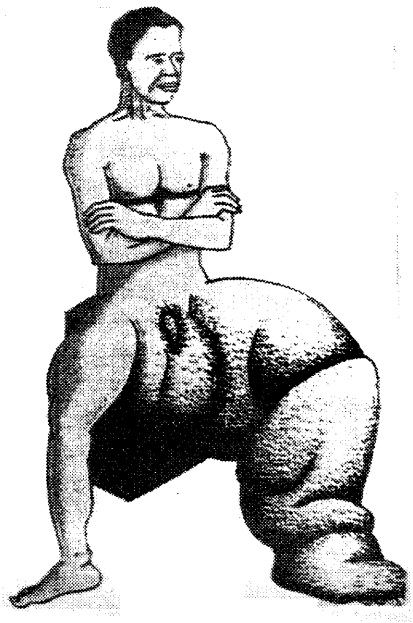
(Scores : 2)

9. "BOD is commonly calculated as an index of water pollution."

(a) Do you agree with this statement ? Why ?

(b) Expand BOD. **(Scores : 2)**

10. Identify the disease shown in the following figure and write the causative organism of the disease.



(Score : 1)

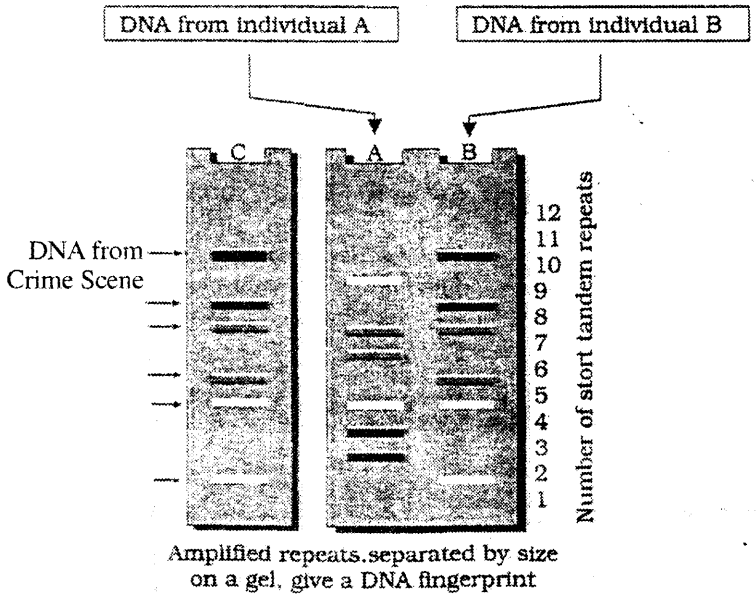
11. "Blood of a man is tested positive for cannabinoid."

(a) What are these ?

(b) From where these are extracted naturally ?

(c) Which part of the body is affected by these ? **(Scores : 3)**

12. Schematic representation of DNA fingerprints are shown below :
[Hints : C is a sample taken from a crime scene, A and B from two suspected individuals]



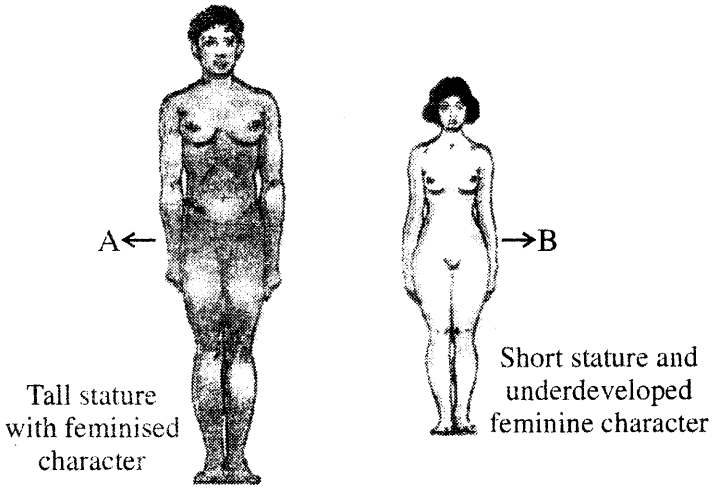
(a) Which one of the suspected individual may involved in the crime ?

(b) Write any other use of DNA fingerprinting.

(Scores : 2)

13. Breast feeding during initial period of infant growth is necessary to develop immunity of new born babies. Why ? **(Score : 1)**

14. Observe the figures and answer the questions.



(a) Identify the syndromes A and B.

(b) What is the chromosome numbers in A and B ?

(Scores : 2)

15. Which theory talks about the huge explosion that leads to origin of universe ? **(Score : 1)**

16. Read the principle and answer the questions :

"Allele frequencies in a population are stable and constant from generation to generation called genetic equilibrium."

(a) Name the principle mentioned here.

(b) Mention any two factors affecting the equilibrium.

(c) What is the significance of disturbances occur in the genetic equilibrium ?**(Scores : 3)**

OR

'Natural selection can lead to stabilisation, directional change and disruptive changes.'

Explain the terms stabilization, directional change and disruptive change mentioned above. **(Scores : 3)**