

Reg. No. :

Code No. 1017

Name :

Time : 2 Hours

Cool-off time : 20 Minutes

Preparatory Time : 5 Minutes

Second Year – March 2016

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 സുവോളജിയിലും 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.
- 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

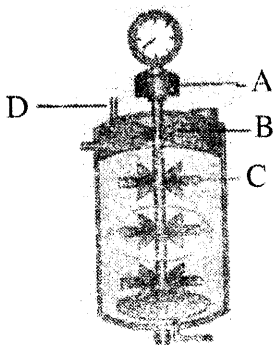
(b) Organism are influenced by biotic and abiotic factors. Write an account of any three abiotic environmental factors. (Scores : 3)

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)

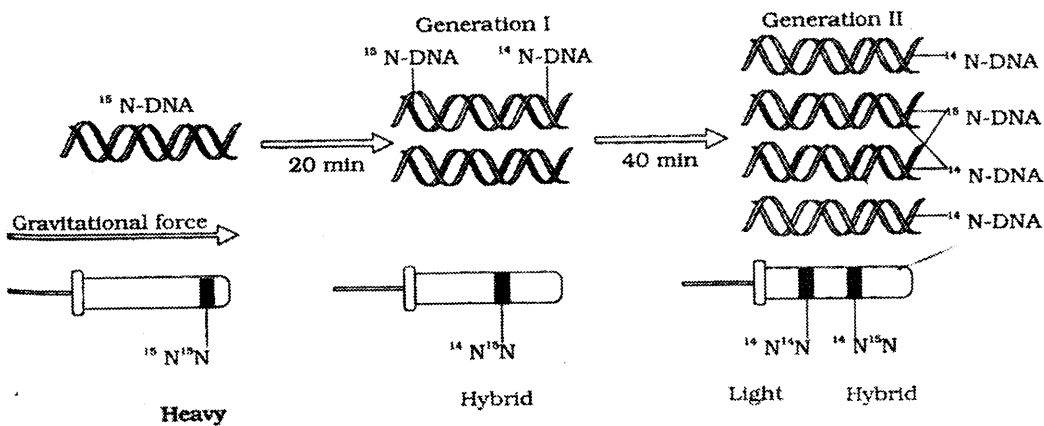
Son (Blood group O)

- (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.

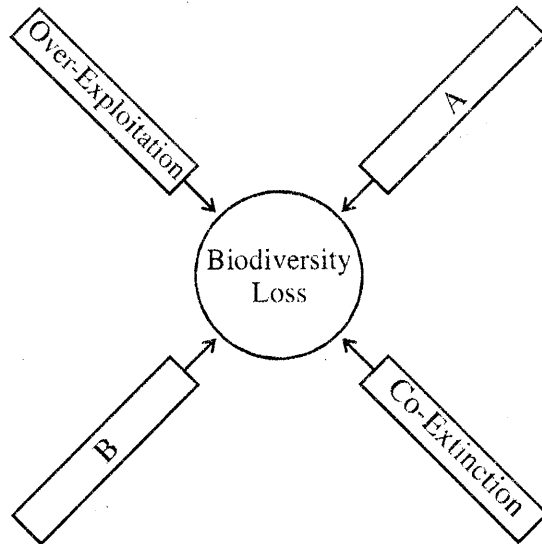


(Separation of DNA by Centrifugation)

- (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 ?

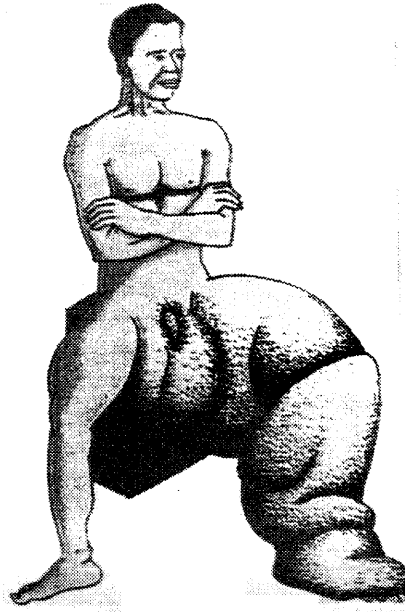
(Scores : 2)

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.



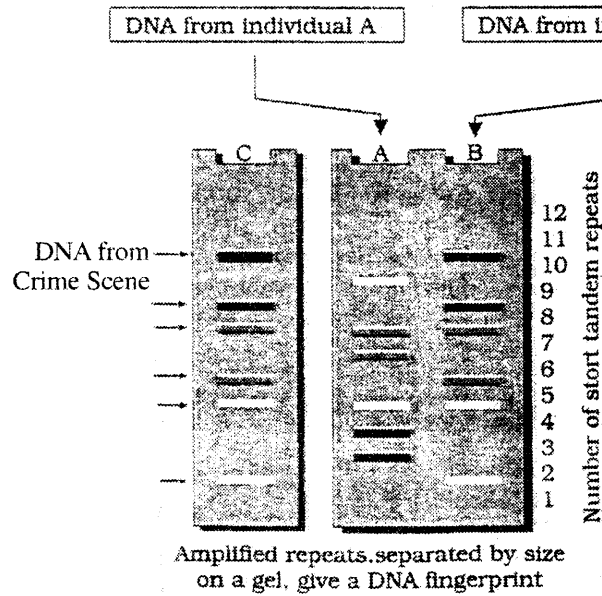
(Score : 1)

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]

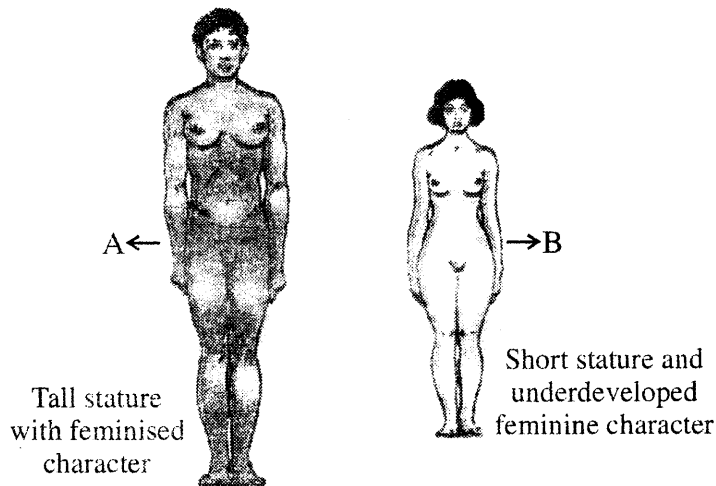


- (a) Which one of the suspected individual may involved in the crime ?
 (b) Write any other use of DNA fingerprinting.

(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)