



THE OPEN UNIVERSITY OF SRI LANKA
B. Sc. DEGREE PROGRAMME – LEVEL 04 – 2007/2008
Botany – BTU 2102/ BTE 4102 – Genetics, Evolution & Introductory Molecular Biology

ASSESSMENT TEST II – NO BOOK TEST (NBT)

Reg. No. -----

DURATION: ONE HOUR

DATE: 12th October 2007

TIME: 4.00 p.m. – 5.00 p.m.

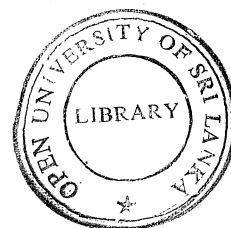
This paper contains two (02) questions in Part A and two (02) questions in Part B.

There are ten (10) pages in the question paper.

Answer all questions.

Answers should be written in the space provided in the question paper.

PART A (50 marks)



1.

a) What is a nucleotide ?

b) What is the composition of a single nucleotide ?

- Estimate the size of the codone.

- 5' - AUG AAG GGC UUU GGC CAU GGG GAU AAG UAC - 3'

[illegible]

2

2.

a) Distinguish between DNA and RNA

i) Chemically

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ii) Functionally

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iii) Location of the cell

b) For each of the following nucleic acid molecules, state whether it is DNA or RNA and single or double stranded

Molecule	%A	%G	%T	%C	%U
a.	33	17	33	17	0
b.	33	33	17	17	0
c.	26	24	0	24	26
d.	21	40	21	18	0
e.	15	40	0	30	15
f.	30	20	15	20	15

PART B (50 Marks)

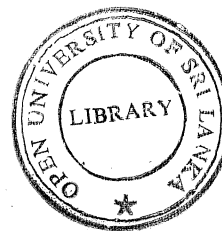
PART B has 2 (02) questions. Submit the question paper with the answer sheet.

Question 1. There are fifteen (15) multiple choice questions. Insert a cross (X) against the correct answer in the relevant cage of the answer box given below.

Question 2. Answer for the structured essay question should be written in the space provided in the **question paper** itself.

Answer sheet for question 1 of PART B.

Ques. No.	a	b	c	d
1.1				
1.2				
1.3				
1.4				
1.5				
1.6				
1.7				
1.8				
1.9				
1.10				
1.11				
1.12				
1.13				
1.14				
1.15				



Q 1.

1.1 The basic unit of the natural selection is the

- a) gene pool of the population.
- b) phenotype of the individual.
- c) gene frequency of the population.
- d) genotype of the individual.

1.2 Earth was formed about

- a) 5 billion years ago.
- b) 10 billion years ago.
- c) 15 billion years ago.
- d) 20 billion years ago.

1.3 Gene frequencies of a population will remain constant if

- a) the population is small and mutations occur.
- b) mating is random and mutations occur.
- c) the population is large and the mutation rate is constant.
- d) mating is random and mutations do not occur.

1.4 Pre-mating reproductive isolating mechanisms

- a) prevent development of zygote.
- b) prevent inter-population mating.
- c) lower the viability of zygotes.
- d) prevent fertilisation of gametes.

1.5 Natural selection is a theory that attempts to

- a) account for the mechanism producing variation.
- b) explain the process of evolution.
- c) provide the evidence for evolution.
- d) account for the mechanism producing random reproduction.

1.6 The basic unit of evolution is the

- a) population.
- b) individual .
- c) family.
- d) species.

1.7 Hybridization does not occur between adult estuarine cichlids, *Europlus suratensis* and *Europlus maculatus* because the adult size of *E. maculatus* is less than one half that of *E. suratensis*. This is an example of

- a) habitat isolation.
- b) seasonal isolation.
- c) mechanical isolation.
- d) gametic isolation.

1.8 DNA molecules

- a) have the ability to replicate.
- b) have the ability to control the functioning of cells.
- c) are the hereditary material of all living organisms other than few bacteria and viruses.
- d) have all the above features.

1.9 Which of the following groups includes eucoelomates only ?

- a) Round worms, rotifers, hair worms.
- b) Coelenterates, flat worms, round worms.
- c) Flat worms and ribbon worms.
- d) Annelids and all the other bilateral metazoans.

1.10 A haemocoel is present in

- a) flat worms and ribbon worms.
- b) echinoderms and chordates.
- c) arthropods and annelids.
- d) arthropods and molluscs.

1.11 In Miller's experiment, organic molecules including many kinds of amino acids were synthesized from

- a) NH_3 , CH_4 , N_2 and H_2O .
- b) NH_3 , CH_4 , H_2 and H_2O .
- c) NH_3 , CH_4 , H_2 and O_2 .
- d) NH_3 , CH_4 , H_2 and H_2O_2 .

1.12 The largest proportion of primate families are found in the

- a) Neotropical region.
- b) Ethiopian region.
- c) Oriental region.
- d) Nearctic region.

1.13 Cenozoic era is referred to as the age of

- a) ancient life.
- b) modern life.
- c) primitive life.
- d) medieval life.

1.14 Which of the following statements is incorrect about new world monkeys ?

- a) They have long prehensile tail.
- b) Their limbs are used for grasping.
- c) They have flat nose with widely separated and outwardly directed nostrils.
- d) Their teeth consist of 3 premolars and 3 molars in each half of a jaw.

1.15 Which of the following statements is incorrect about Neanderthal man ?

- a) They lived nearly 20000 – 50000 years ago.
- b) They are heavily built and short in stature.
- c) They covered their bodies with skins of animals.
- d) They made and used excellent flint tools.

Q 2.

2.1 What is meant by "gene frequency"

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2.2 What is "Kin selection" ?

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2.3 Explain the term "Clinal variation"

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2.4 What is "Adaptive radiation" ?

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2.5 Explain the term "hybrid sterility".

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