SRI LANKAN BIOLOGY OLYMPIAD
MODEL PAPER 2008

Instructions:

- Final examination contains two parts to the test, A and B.
- **Part A** consists of 50 multiple choice questions.
- **Part B** consists of 25 short answer questions.
- Part A questions, each score 1 mark, total 50
- Part B questions, each score 2 marks, total 50
- You have a total of **2 hours** to complete both sets of questions.
- This Model Examination contains **10 multiple choice questions and 8 short answer questions.**

Part A – Multiple Choice Questions

1. Which of the following is not true regarding proteins?
   (1) Some proteins increase the rate of specific chemical reactions.
   (2) Some proteins form either long fibrous molecules while others make compact globular molecules.
   (3) Some proteins contain sulphur in their composition
   (4) Some proteins combine with nucleic acids to make complex structures
   (5) Some proteins form the hereditary material of some viruses +

2. Which of the following reasons could have been mostly responsible for great biodiversity extinction that happened in Permian period?
   (1) Epidemic diseases
   (2) Climatic changes +
   (3) Appearance of reptiles
   (4) Volcanic action
   (5) Impact of meteorites

3. Sri Lanka is named as a biodiversity hotspot because, Sri Lanka has
   (1) highest number of species in the Asian region
   (2) large land areas of rain forests
   (3) very large population of migratory birds
   (4) a large number of highly threatened species +
   (5) a high species diversity

4. For which of the following events of photosynthesis thylakoid membranes are least important?
   (1) Excitation of chlorophyll molecules by light energy
   (2) Transfer of electrons from chlorophyll molecules to primary electron acceptor
   (3) Synthesis of PGA +
   (4) Synthesis of ATP
   (5) Synthesis of $NADPH_2$

5. Which of the following is an incorrect statement regarding reproduction of *Nephrolepis*?
   (1) Its gametophyte is dioeceous. +
   (2) Its sporophyte is nourished by the gametophyte in early stages of growth.
   (3) Its gametophyte produces multiflagellate male gametes.
   (4) Sporangia are produced by the leaves of sporophyte
   (5) Sporangium produces a large number of haploid spores

6. Which of the following hormones is incorrectly paired with its origin?
   (1) progesterone – placenta
   (2) releasing hormone – hypothalamus
   (3) TSH – thyroid +
   (4) mineralocorticoids – adrenal cortex
   (5) glucagon - pancreas

7. What is the main function of human lymphocytes
   (1) production of antibodies +
   (2) transportation of oxygen
   (3) clotting of blood
   (4) responding to inflammation
   (5) transport of carbon dioxide

8. In *Drosophila* red eye is a dominant character while white eye is a recessive character. When a white eyed male was crossed with a red eyed female all F1 flies were red eyed. When a male and a female from F1 progeny were crossed ¼ th of the F2 progeny had white eyes and $3/4^{th}$ had red eyes. All the white eyed flies were however, males. Which of the following is the most likely explanation for these results?
   (1) White eye is lethal to female flies
   (2) White eyed females have mutated to be red eyed
   (3) Genetic recombination event has taken place in sex chromosomes
   (4) White eye character is a sex linked character +
   (5) White eye gene is not expressed in females

9. Which of the following is an incorrect match of antibiotic-action relationship?
   (1) Tetracyclin – inhibition of protein synthesis
   (2) Griseofulvin – damaging cell membranes
   (3) Penicillin – inhibition of cell wall synthesis
   (4) Erythromycin – damaging cell membranes +
   (5) Polymixin – damaging cell membranes

10. Which of the following pathogens of man is transmitted by a vector?
   (1) *Vibrio cholerae*
   (2) *Wucheraria bancroftii* +
   (3) *Entamoeba histolytica*
   (4) *Necator americanus*
   (5) *Bacillus tuberculosis*

Part B – Short Answer Questions

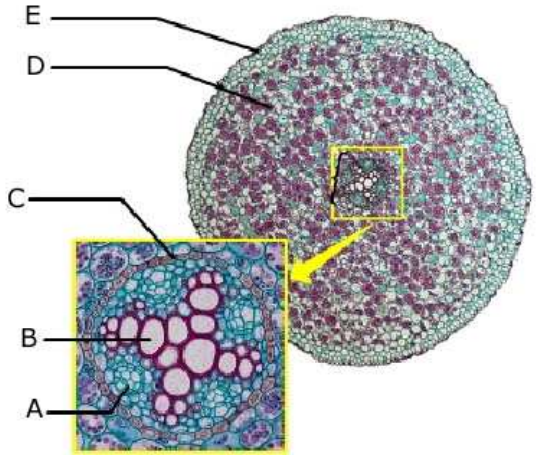
1. Five substances associated with living cells are given below.
   A. Sucrose B. Pectin C. Chitin D. Fructose E. Lactose
   (1) Which (one or more) of these can answer Fehling's test? ----------
   (2) Which (one or more) of these can be found in fungi? ----------
   (3) Which (one or more) of these cannot be considered as sugars? ----------
   (4) Which (one or more) of these can be found associated with plant cell walls? -------

   (1) D E (2) C (3) B C (4) B

2. Five living species found in Sri Lanka are as follows.
   A. *Elephas maximus* B. *Cycas circinalis* C. *Dipterocarpus zeylanicus*
   D. *Pinus caribaea* E. *Puntius nigrofasciatus*
   (1) Which of the above is an example for a relict species? ----------
   (2) Which of the above is an example for a threatened species? ----------
   (3) Which of the above is an example for an exotic species? ----------
   (4) Which of the above is an example for a flagship species? ----------

   (1) B (2) A E (3) D (4) A

3. This question is based on structures A – E shown in the diagram of a root Transverse Section given below.



(1) In which cells the starch is stored? _____
(2) Name the tissue type B _____
(3) Which cells prevents the apoplast movement of minerals _____
(4) Function of E _____

(1) D (2) Xylem (3) C (4) Absorption of water and minerals

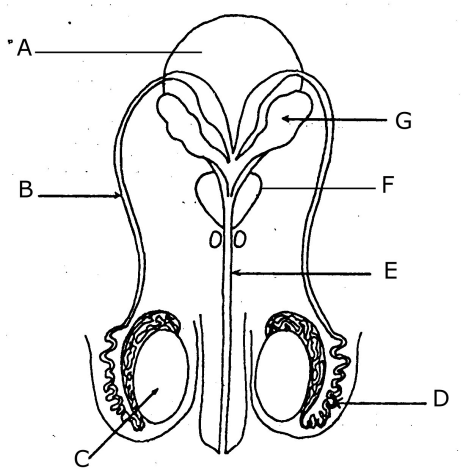
4. Some human hormones are listed below.

A. LH B. Insulin C. glucagon D. adrenaline E. progesterone

(1) Which of the above increases blood glucose level ? ----------
(2) Which of the above induces ovulation? ----------
(3) Which of the above increases the rate of heart beat? ----------
(4) Which of the above inhibits secretion of FSH and LH? ----------

(1) C (2) A (3) D (4) E

5. The diagram shows the human male reproductive system and some associated structures.



Give the appropriate letter relating to the following structures.

(1) a place where meiosis occurs _____
(2) a place where sperms are stored _____
(3) structures which contribute to secretion of semen _____
(4) an endocrine organ _____

(1) C (2) D (3) C G F (4) C

6. Five species microorganisms are given here.

A *Clostidium tetani*
B *Acetobacter aceti*
C *Saccharomyces cerevisiae*
D *Nirosomonas* sp.
E *Azotobacter* sp.

Select the species that,

(1) Surviving in anaerobic conditions _____
(2) Convert sucrose to acetic acid _____
(3) Involving in nitrogen recycling _____
(4) Is/ Are used in Biotechnology _____

(1) A C (2) C B (3) D E (4) B C

7. Names of five biomes of the world are given below.

A. Taiga B. Tundra C. Chaparral D. Savanah E. Deserts

(1) Which of these can be found in arctic region? ----------
(2) Which of these is dominated by coniferous trees? ----------
(3) Which of these is characterized by frequent fires? ----------
(4) Which of these have rainy winters and long hot dry summers? ----------

(1) B (2) A (3) D (4) C

8. Five types of fish species are given here.

A Skipjack Tuna B Herring C Spanish mackerel D Shark
E Common carp

Which of the above fishes have (select one or more)

(1) dorsal finlets? _____
(2) placoid scales? _____
(3) barbels? _____
(4) single dorsal fin? _____

(1) A C (2) D (3) E (4) B E