Department of Examinations, Sri Lanka | 09 | E | II
General Certificate of Education (Adv.Level) Examination, August 2001
Biology - II (New Syllabus) Three Hours

Part A - Structured Essay
Answer all questions on this paper it self.

01.

(A) The question (i)-(iv) are based on the diagram of different organism given below.

A B C D

(i) Name the Kingdoms to which these organisms are classified?

A ..... B .....
C ..... D .....

(ii) State **three** specific features of each of the Kingdoms to which A and D belong.

Kingdoms of *A*

.....

Kingdoms of *D*

.....

(iii) State the nutritional types shown by *B* and *C* taking into consideration their sources of energy and carbon.

B ..... C .....

(iv) State **three** major differences between **A** and a virus

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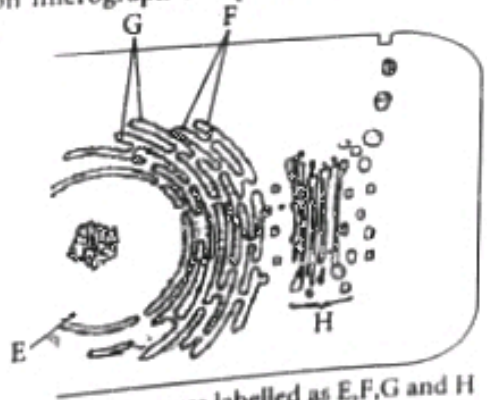
(B) The question **(i) and (ii)** are based on the diagram of an electron micrograph of a part of an animal cell given below



(i) Name the structures labelled as E,F,G and H

E ..... F .....
G ..... H .....

(ii) What are the major functions of *G* and *H*?

G ..... H .....

(C) (i) What are the **four** major types of organic compounds found in an eukaryotic cell?

.....
.....

(ii) State the major polymeric compound/compounds found in the following.

(a) Plant cell wall .....
(b) Bacterial cell wall .....
(c) Storage material in liver cells .....
(d) Ribosomes .....

(iii) What is the common respiratory substrate in living cells?

.....

(iv) Describe a simple test to confirm the presence of reducing sugars in germinating mung seedings.

.....
.....
.....

(D) (i) Figures *P* and *Q* show two stages of mitosis. Name these stages and write below **three** major events taking place during each of these stages.

P ..... Q .....

Major events in stage *P* | Major events in stage *Q*

....
....
....

(ii) State the significance of mitosis

.....
.....

02.

(A) (i) Explain briefly why a blood circulatory system devoloped during the evolution of animals

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.....

(ii) What is an open blood circulatory system?

.....
.....
.....

(iii) Name a phylum which includes animals with an open blood circulatory system?

.....
.....

(iv) what is the mean by double circulation?

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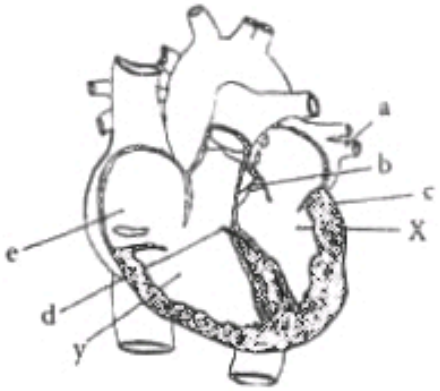
.....

(v) Name a class which includes animals with a complete double circulation

.....

(B) **The questions (i) -(iii) are based on the following diagram of a longitudinal section of the human heart.**



(i) Name the structures labelled as *a*, *b*, *c*, *d*, and *e*.

.....

(ii) What is the function of *c*?

.....

(iii) Why is the wall of X more muscular than that of Y?

.....

(iv) What is the pacemaker of the human heart?

.....

(v) Where is the pacemaker located in the human heart?

.....

(C) (i) What are the major events that take place in the human heart during the completion of one heart beat?

.....

.....

(ii) What is the blood pressure of a normal healthy adult man at rest?

.....

.....

(iii) State **three** structural differences between a cardiac muscle fibre and a smooth muscle fibre.

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.....

.....

(D) (i) What is the blood pigment found in annelids?

.....

(ii) Name the human white blood corpuscle that has a kidney shaped nucleus.

.....

(iii) What is the percentage range of these white blood corpuscles in the blood of a normal healthy adult person?

.....

(iv) State a major function of these white blood corpuscles.

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03.

(A) The diagram given below indicates different stages of the life cycle of *Cycas* plant.

(i) Name the stages labelled as 1, 2, 3, 4, 5 and 6?

.....

(ii) Which stage of the above diagram is homologous to the stamens of flowering plants?

.....

(iii) Which stage of the above diagram is homologous to carpels of flowering plants?

.....

(B) Give **three** differences that could be identified when the life cycle of *Cycas* given in the above diagram is compared with the life cycle of *Selaginella*:

	Cycas	Selaginella
(i)	.....	.....
(ii)	.....	.....
(iii)	.....	.....

(C) Given below are, the names of some tissues found in plant stems

epidermis	cortex	pericycle
phloem	vascular cambium	pith
cork	cork cambium	secondary phloem
protoxylem	metaxylem	secondary xylem
protoderm	secondary cortex	ground meristem

(i) Name the **three** of the above tissues that are developed from the procambium

(1) ..... (2) .....

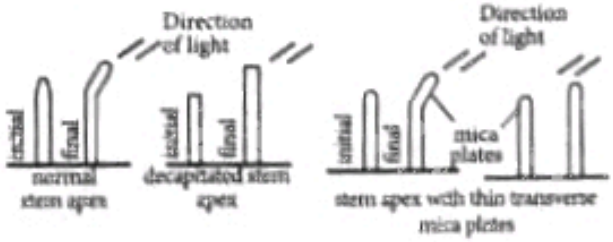
(3) .....

(ii) Name the **three** of the above tissues that are developed from the procambium.

(1) ..... (2) .....

(3) .....

(D) The diagrams given below represent a series of experiments done in order to understand the mechanism of phototropism of stem apices.



Give **three** conclusions that could be made from the above observations

(i) .....

(ii) .....

(iii) .....

04.

(A) (i) What is an ecosystem?

.....

.....

.....

(ii) If the space given below draw a flow chart to show how energy flows through different trophic level in a terrestrial ecosystem

(iii) To which trophic level / levels do the following organisms belong?

Lizard .....

Garden snail .....

Man.....

Cyanobacteria .....

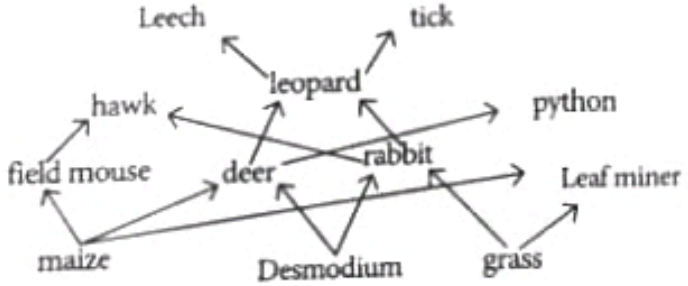
Mushrooms .....

(B) (i) What is a food chain?

.....

.....

Questions **(ii)** - **(iv)** are based on the following diagram of a food web in a terrestrial ecosystem



(ii) Give a food chain that includes an ectoparasite.

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(iii) Name **two** possible Competitors of rabbits

.....

(iv) What would be the immediate effect if the hawk population decreases in large numbers?

.....

(C) Give **three** major environmental effects of discharging water from industries into natural waterbodies

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(D) **(i)** Indicate **three** major sources, other than industrial wastes, by which inland waterbodies in Sri lanka get polluted.

.....

(ii) State the **three** major steps involved in the water purification process in a municipal water purification plant and indicate briefly the role of each step.

Major step	Role
(a)	.....
(b)	.....
(c)	.....

Part B - Essay

Answer **four** questions only.

01. Explain how blood glucose level is regulated in man

02. (i) What is understood by the terms pathogen and virulence in relation to micro-organisms?

(ii) Describe briefly the non-specific defense systems which operate against microbial infections in the human body.

03. (i) Explain the roles of ATP, $NADPH_2$, and Ribulose bisphosphate carboxylase enzyme in photosynthesis

(ii) Briefly describe why C_4 plants are more efficient than C_3 plants in photosynthesis.

04. (i) State Mendel's Laws and explain what are Mendelian ratios.

(ii) Explain how the ABO blood groups of humans are inherited

05. (i) Briefly describe the **three** major methods of insect pest control used in Sri Lanka.

(ii) State the advantages and disadvantages of each of these methods

06. Write short notes on the following

(i) In-situ and ex-situ conservation of biodiversity

(ii) Human placenta

(iii) DNA probes and their applications